# The NATIONAL GEOGRAPHIC MAGAZINE

Vol. XV JULY, 1904 No. 7

CONTENTS

PAGE

Governing the Philippine Islands. By Colonel Clarence R. Edwards, U. S. Army. Illustrated . . . . . 273

Forecasting the Weather. Illustrated . . . . . 285

Notes on Tibet. Illustrated . . . . . 292

The Bullock-Workman Explorations . . . . . 294

A New Harbor in Porto Rico . . . . . 295

Geographic Literature . . . . . 295

Eighth International Geographic Congress . . . . . 297

Published by the National Geographic Society,
Hubbard Memorial Hall,
Washington, D. C.

$2.50 a Year REPRINT 25 Cents a Number

Entered at the Post-Office in Washington, D. C., as Second-Class Mail Matter

# THE NATIONAL GEOGRAPHIC MAGAZINE

AN ILLUSTRATED MONTHLY, published by the NATIONAL GEOGRAPHIC SOCIETY, at Washington, D. C. All editorial communications should be addressed to the Editor of the NATIONAL GEOGRAPHIC MAGAZINE, Hubbard Memorial Hall, Washington, D. C. Business communications should be addressed to the National Geographic Society, Hubbard Memorial Hall, Washington, D. C.

25 CENTS A NUMBER; $2.50 A YEAR

Editor: GILBERT H. GROSVENOR

Associate Editors

GENERAL A. W. GREELY
*Chief Signal Officer, U. S. Army*

W J McGEE
*Chief, Department of Anthropology and Ethnology, Louisiana Purchase Exposition*

C. HART MERRIAM
*Chief of the Biological Survey, U. S. Department of Agriculture*

WILLIS L. MOORE
*Chief of the Weather Bureau, U. S. Department of Agriculture*

O. H. TITTMANN
*Superintendent of the U. S. Coast and Geodetic Survey*

O. P. AUSTIN
*Chief of the Bureau of Statistics, Department of Commerce and Labor*

DAVID T. DAY
*Chief of the Division of Mineral Resources, U. S. Geological Survey*

IDA M. TARBELL
*Author of "Life of Napoleon," "Life of Lincoln," etc.*

CARL LOUISE GARRISON
*Principal of Morgan School, Washington, D. C.*

WASHINGTON, D. C.

VOL. XV, No. 7 WASHINGTON JULY, 1904

THE NATIONAL GEOGRAPHIC MAGAZINE

# GOVERNING THE PHILIPPINE ISLANDS*

BY COLONEL CLARENCE R. EDWARDS, U. S. ARMY,

CHIEF OF BUREAU OF INSULAR AFFAIRS

ONE of the wisest provisions contained in President McKinley's instructions to the Taft Commission, which has gained congressional approval, was the provision that appointments should be made by the civil governor, by and with the advice and consent of the Philippine Commission. Under this authority the Commission has enacted civil-service legislation which I believe is as practical and effective a civil service as exists in any country today. It is more comprehensive than the United States statutes, and the result has been, since I have been the chief of the Bureau, that not one single instance can I recollect where appointments have been made contrary to law, contrary to the one idea in view—merit and the best interests of the Philippine service and rights of the Filipino. I hardly know the politics of an employé in the Philippine service except those of the Philippine Commission, and I call to your attention the fact that the Senate has already confirmed, to take effect the first day of February, the nomination as civil governor of the Philippines of the Hon. Luke E. Wright, a prominent Democrat of Tennessee. The only appointments made by the President are the civil governor, vice-governor, members of the Commission, and supreme court of the Philippines.

This Bureau is charged with the labor in the United States incident to the selection of appointees upon the certification of the United States Civil Service Commission after examination, and the arrangement for their transportation to the Philippines, as well as matters relating to appointment in the corps of teachers, the judiciary, and positions not subject to the requirements of the civil-service law.

The inauguration of complete civil government in the Philippines, occurring as it did simultaneously with the muster out of the twenty-four volunteer regiments of infantry serving in those islands, resulted in a great number of the personnel of such regiments being appointed to civil positions, as those honorably discharged

*Concluded from "The Work of the Bureau of Insular Affairs," by Colonel Edwards, June, 1904.

from the Army and Navy constituted a preferred class, and with the few appointments, generally of a highly technical or scientific character, necessary to be made in the United States, the United States Civil Service Commission conducted the preliminary inquiries and advised this Bureau of the names of the persons to be appointed, whereupon transportation was arranged.

At this time, however, more than two years subsequent to the muster out of these volunteer regiments, there is not material available in the islands for appointment to many civil employments, which has made it necessary that such appointments be made in the United States, both to vacancies caused by resignations and to the newly created positions caused by the extension of civil government throughout the archipelago.

Furthermore, on September 1, 1903, the corps of American teachers employed in the insular civil service became subject to civil-service rules, and since that time—that is, within the past four months—over one hundred and fifty school teachers alone have been selected and appointed under competitive civil-service examination.

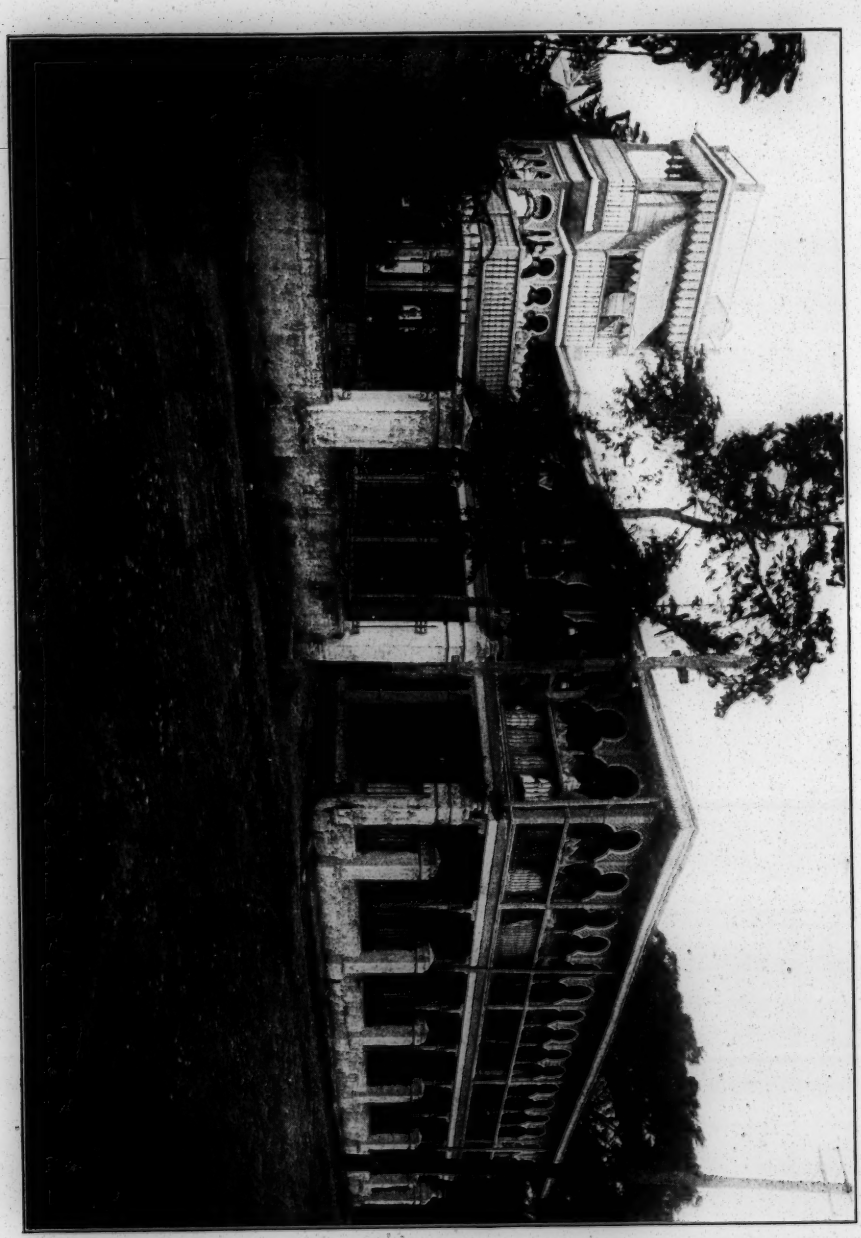
The Philippine laws require that in addition to the general labor incident to appointments each appointee execute a contract with the Insular Bureau, in legal terms, to comply with certain requirements of that service. Appointments have been made to all classes of positions, ranging upward from that of clerk and including many of a scientific, technical, or professional character, as well as trades positions. Difficulty was experienced in properly filling a large number of newly created positions of a highly scientific and technical character incident to the development of the work relating to the laboratory and agricultural bureaus in the islands. The Bureau has had recourse to forty-two different eligible lists of the Civil Service Commission in making appointments within the past year, aside from the fact that many appointments have been made by transfer of persons already in the United States service, and to the judiciary, which is not subject to civil-service requirements. However, the number of persons appointed under competitive civil-service examination during the past year was about 400.

All insular employés on leave of absence in the United States are required to report promptly in writing to the Insular Bureau and look to that office for arrangements for their return to the islands.

During the past year the Bureau was able to persuade the United States Civil Service Commission to recommend to the President an amendment to the civil-service rules which made it possible for a person who had rendered loyal and faithful service in the Philippines to be eligible to transfer to the United States service. Such a step tends to the establishment of a system of ultimate reward at home for efficient service in the insular possessions. The Civil Service Commission, however, only issues such certificates upon the statement of this Bureau of a clean record in the Philippines.

On account of the crowded condition of the transport service, which is maintained primarily for the accommodation of the military, the Bureau entered into a contract with the large railway and steamship lines whereby it enjoys an economical rate from all points in the United States to Manila and return for the benefit of insular appointees, as well as members of their families. A system of transportation orders, as well as their details, have been worked up and about fifty or sixty persons are now being monthly booked from various points in the United States and transported to Manila via commercial lines.

Deaths of all insular employés, from whatever causes, are promptly reported to the Insular Bureau by cable, and



INSULAR NORMAL SCHOOL—GIRLS' DORMITORY.

thereupon it assumes the obligation of advising the nearest of kin of such employé of all particulars relating to the death, the conditions under which the remains may be returned, and finally, after complying with the legal requirements as to proofs of heirship, the absolute transmission of the estate, if any, is made. This grows out of the fact that under Philippine legislation the treasurer of the Philippine Islands becomes the administrator of the estates of all Philippine employés within certain limits, and this Bureau is his instrumentality in this country.

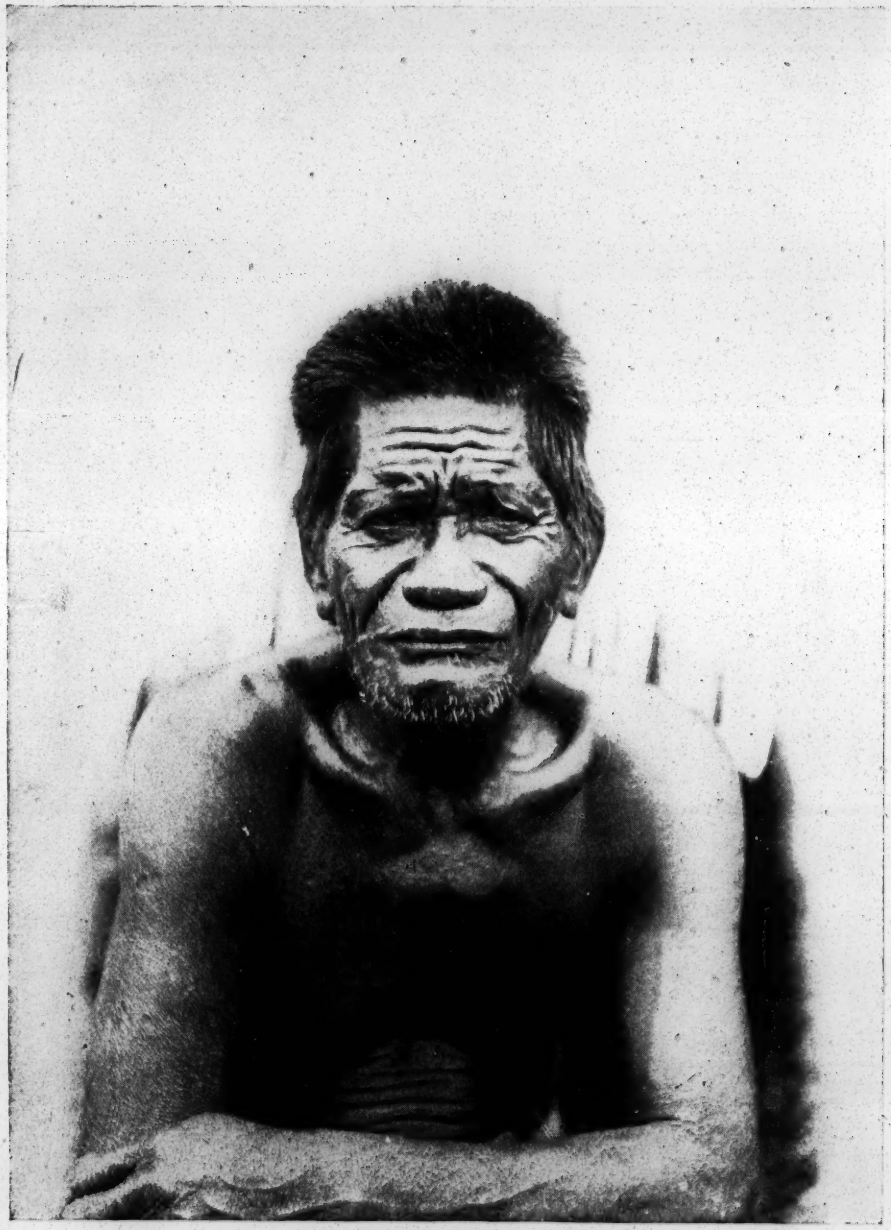
### EDUCATION OF FILIPINO YOUTHS IN THE UNITED STATES

The question of the bringing to the United States of Filipinos for education in this country has long been the subject of much discussion and correspondence both by the Philippine government and by this Bureau. Last summer the Philippine Commission passed an act to carry into effect the policy which had been decided upon, with a proviso that upon the return of such students they enter the civil service of the islands. There are at the present time in the United States ninety-eight Filipinos to be educated as authorized by this act. All arrangements for their reception and transportation to southern California were made before their arrival in the United States. They are now placed in the first grammar, high schools, and colleges in that section to avoid the rigorous climate of the East during their first winter.

This work is by the act of the Philippine Commission under the special supervision of the Bureau of Insular Affairs, and the expenditures in the United States in connection with this work are payable out of funds in the custody of the disbursing agent of Philippine revenues stationed in this Bureau. The agent who accompanied these students to the United States has in the last few days made his first quarterly report as required by the Philippine act under which he is serving. I believe it would interest you to quote his conclusion of this report:

"In conclusion, it is especially desired to call the attention of the educational authorities of the Philippine Islands to the necessity, in the selection of students to be sent to America, for exercising the greatest care. The standard raised by those who have already come to America should be upheld. The exceedingly favorable impression created by the members of the first expedition, without exception, should not be impaired. The Filipino students now here are cited continually by parents and by teachers to their young American associates as models of gentleness, thoughtful politeness, studiousness, and of seriousness of purpose. Right here I desire to say that no other class of Filipinos whom I have known have in any degree compared with the Filipino students sent to America in their appreciation and gratitude for the benefits conferred upon them, for the forbearance and patience shown them, and the opportunities offered them for progress by the government. I have reports from their teachers and housekeepers at every place that the danger is not that they will study too little, but that they will study too much. They were uniformly successful in the examinations held by their schools just prior to the holidays, despite their late entrance to the schools and the short time that they have been studying their texts in English. They are all working with splendid seriousness for the accomplishment of the lofty purposes for which they are in this country, and I only ask that as good material be furnished in the future; that not one young man or young woman in whom the fullest confidence may not be placed, and whose fitness, mental and physical, is not of the very highest order, be sent by the government for education

IBILAO HUNTER IN RAIN COAT AND HAT OF DEER HIDE, MOUNTAINS OF EASTERN NUEVA VIZCAYA.



SULU MORO MAN, COARSE TYPE.

in the United States. There is no scarcity of such material, and if it be sent I feel that there can be no question as to the final result."

PHILIPPINE CURRENCY

As an illustration of how both Washington and Manila work through the Bureau, let me make mention of the work necessary to be performed in the United States in carrying out the orders of the Secretary of War and the enactments of the Philippine Commission putting into effect the act of Congress providing for a monetary system in the Philippines, which had been under consideration by Congress for two years.

Under the authority of sections 76 to 83, inclusive, of the Philippine government act and of the act entitled "An act to establish a standard of value and to provide for a coinage system in the Philippine Islands," approved March 2, 1903, by instructions from the Philippine government the Bureau supervised the coinage of 14,145,000 silver pesos, 3,100,000 50-centavo pieces or half pesos, 5,350,000 20-centavo pieces, 5,100,000 10-centavo pieces, 8,850,000 5-centavo pieces, 10,600,000 1-centavo pieces, 11,950,000 half-centavo pieces, making an aggregate in face value of 17,883,250 silver pesos, each of the face value of one-half an American gold dollar and having an aggregate face value of $8,941,625 gold money of the United States.

The coins were made from designs by Melecio Figueroa, a Filipino artist of distinction, and both in the artistic quality of the designs and in perfection of workmanship they compare favorably with anything of the kind ever done in America. The silver bullion purchased for this coinage amounted to 13,520,895.82 ounces. The cost of the bullion amounted to $7,372,990.11. Of the amount purchased, 1,115,234.52 ounces were purchased from the Mexican Pious Award fund in the hands of the Department of State. The remainder was purchased from various firms and corporations upon offers tendered twice a week in response to a public invitation.

The total quantity of silver bullion actually consumed in making the coins above specified was 13,478,448.07 ounces and the cost thereof $7,342,588.89.

The purchase of bullion for the present has been suspended. In the meantime the old Spanish-Philippine coinage is being collected and shipped to the United States for recoinage. It is estimated that there are some 12,000,000 pesos of this coinage. Mexicans were demonetized on January 1.

The price at which this silver bullion was purchased ranged from 49.10 cents per ounce to 60.47 cents per ounce. The average price paid was 55.193 cents per ounce. This makes the cost to the Philippine Government of the silver in each peso coined equal to 43.05 cents. The difference between the actual cost of the bullion consumed in making the coins above mentioned, including the cost of base metal for alloy and minor coins, and the total face value of the coinage is $1,495,644.85. The total cost of coining, transportation, insurance, packing, and miscellaneous expenses was $256,930.35, leaving a seigniorage or profit to the Philippine Government, consisting of the difference between the face value of the new coins and the total cost of the new coins delivered in Manila, amounting to $1,238,714.50. This sum will go into the special fund for the maintenance of parity between the new coins and the money of the United States.

Section 8 of the act of March 2, 1903, authorized the treasurer of the Philippine Islands, in his discretion, to receive deposits of the standard silver coins of 1 peso in sums of not less than 20 pesos, and to issue silver certificates therefor in denominations of not less than 2 nor more than 10 pesos, retain-

ing the deposited coin in the Treasury "to be held and used for the payment of such certificates on demand, and for no other purpose," thus supplying for public convenience government notes representing silver coin actually held by the government as against the notes.

Under this provision certificates have been engraved, printed, and delivered at Manila representing 10,000,000 silver pesos. Of these, 4,000,000 were in 10-peso notes, 4,000,000 in 5-peso notes, and 2,000,000 in 2-peso notes. This work was admirably done by the very considerate and public-spirited coöperation of the Bureau of Engraving and Printing. The 10-peso notes bear the engraved vignette of President Washington; the 5-peso notes, of President McKinley, and the 2-peso notes of the Philippine patriot and poet Rizal.

The cost of material, engraving, printing, transporting, and insuring the ten million pesos of silver certificates has been $39,365.36.

*Issue of Certificates of Indebtedness.*—The money for the purchase of bullion and expense of coinage was furnished in part from the general funds of the Philippine Government and in part by the issue of certificates of indebtedness under the authority of section 6 of the Philippine coinage act of March 2, 1903. That section provides that in order to maintain parity between said silver Philippine pesos and the gold pesos provided for by the act, the Philippine Government may issue temporary certificates of indebtedness to the extent of $10,000,000, or 20,000,000 pesos, running not more than one year and bearing interest not to exceed 4 per cent; and it provides that the proceeds of such certificates shall be used exclusively for the maintenance of said parity, except that a sum not exceeding $3,000,000 at any one time may be used as a continuing credit for the purchase of silver bullion.

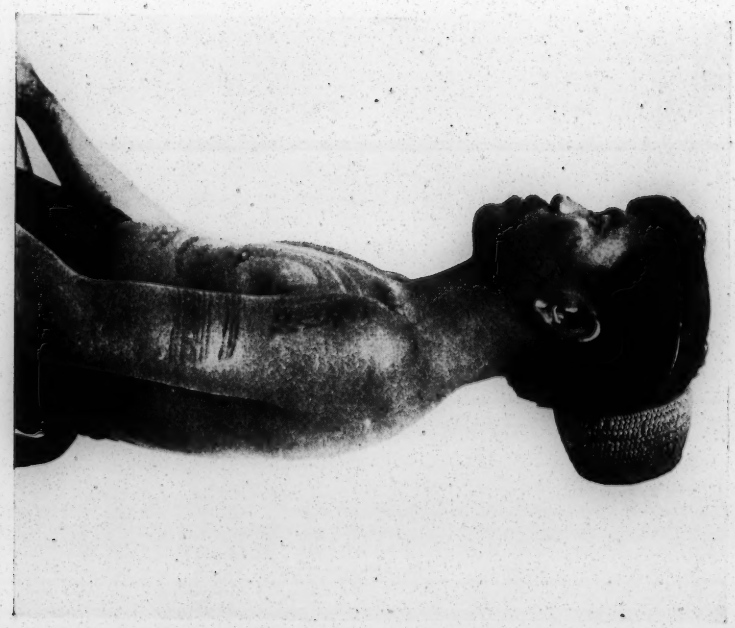
Under these provisions certificates of indebtedness payable one year after date and bearing 4 per cent interest have been issued and sold in the United States to the amount of $6,000,000. Three million dollars thereof, issued specifically for the purchase of bullion, were sold on the 20th of April, 1903, at a premium of 2.513 per cent. The other $3,000,000 thereof, issued specifically for the creation of a gold reserve fund for the maintenance of parity, were sold on the 25th of August, 1903, at a premium of 2.24 per cent, making an average premium of 2.3765 per cent and making the interest charge to the Philippine Government for the use of the money borrowed for one year 1.6235 per cent, or in round figures 1⅝ per cent.

These sales were made upon public advertisement for bids, and the extraordinarily favorable result was due not merely to the credit of the Philippine Government, but to the fact that the Secretary of the Treasury authorized the War Department to announce that the certificates would be received by the Treasury Department as security for the deposit of United States funds in the national banks under certain specified conditions.

Competition between the two depositaries of insular funds in the city of New York, which maintain branches in Manila, had been previously invited, and as the result of this competition the $6,000,000 thus borrowed by the Philippine Government at 1⅝ per cent per annum was deposited with the Guaranty Trust Company of New York at 3½ per cent interest on daily balances.

The ultimate result of the two transactions is that the Philippine Government will have obtained the money to carry through the new coinage without any interest charge, and will make an interest profit on the indebtedness contracted for that purpose.

BONTOK IGORROTE WITH ELABORATE TATOOING OF THE HEAD HUNTER.



PHILIPPINE LAND PURCHASE

*Friar Bonds.*—Another example of finance by this Bureau is the recent sale of bonds to pay the friars for the surrender of their lands to the public domain of the Philippine Government. At the end of the last year, just before Governor Taft started for Washington, we received a cablegram to the effect that his labors for the past four years had been successful; that a definite agreement had been reached, and that the price to be paid for the lands that would settle this troublesome question had been decided upon. That act of July 1, so often mentioned, providing for a temporary civil government for the Philippine Islands, authorized a bond issue to provide funds necessary for this payment. A prospectus or circular was immediately made out offering these bonds to the public, to the highest bidder. Bids were opened January 11 last, and it was found that the offer of 107.577 for the entire seven million dollars' worth of bonds tendered would give a premium of $530,390, which was the most advantageous to the Philippine Government by a little over $75,000. The award was therefore made to the syndicate making this bid. The bonds were registered in denominations of ten thousand and one thousand dollars, bearing respectively the vignettes of President McKinley and Vice-President Hobart.

SUBANON WOMAN, SHOWING NATIVE SKIRT OR "TAPIS," WOVEN OF HEMP.

On February 1 the bonds will be delivered to the successful bidders, and the money derived therefrom devoted to the purchase of the lands according to the agreement made. The purchase price was some $7,240,000. Seven millions of the bonds were sold, leaving a surplus on account of the premium realized of approximately $300,000. This work, under the direction of the Secretary of War and the authority of the act of the Philippine Commission, fell to the lot of this Bureau, whose ability to perform the task under its organization and with the experience gained in previous transactions of this kind in the past can be best judged by the results obtained.

### PURCHASE OF SUPPLIES FOR THE PHILIPPINE GOVERNMENT IN THE UNITED STATES

All supplies for the Philippine Government bought in the United States are purchased by this Bureau. This work is allotted to one of its divisions. To this division is attached, as I have stated before, a fully equipped purchasing agency in New York, where articles of every kind and description are purchased after fair competition, f. o. b. ship's tackle, insured, and shipped to the Philippine Islands. Payments for the same are made by a duly appointed disbursing officer of Philippine funds, an official of this Bureau stationed in Washington. All requisitions for supplies, after approval by the civil governor of the Philippines, are sent to the Bureau and there carefully entered in ledgers, and when the purchases are made the vouchers are carefully audited and compared as to rates, prices, and methods, the check in payment drawn only after order of the Chief of the Bureau, and accounting made to the Auditor of the Philippine Islands, who is the final authority as to the propriety of the disbursement. This disbursing officer paid some 4,000 accounts during the past year, amounting to some $8,000,000.

### STATISTICS, COMMERCE, AND IMMIGRATION

One division of the Bureau is charged with the tabulation of all commercial statistics in the Philippine Islands, direct reports being made to the Bureau by all collectors of customs on prescribed forms and blanks. These statistics are published in monthly summaries of commerce showing all details of the import and export trade. Such compilations were made of Cuba and Porto Rico while under the jurisdiction of the War Department. They have been the only official data for the information of Congress on which were based the resultant tariff laws and other legislation relating to commerce and revenue.

### CAPTURED INSURGENT DOCUMENTS

In one division of this Bureau there are filed some 200,000 documents which were captured at different times from the insurgents in the Philippines. Few of them are of value as military records, but they contain the material for a history of the insurgent government both during its open existence and during the ensuing guerrilla warfare. They include many of the orders and regulations and much of the correspondence of the insurgent officers, and throw much light upon many important matters of which, from an American point of view alone, but a partial understanding can be obtained. These papers, since their receipt in October, 1902, have been carefully arranged, recorded, and filed, and those of special interest indexed and translated. It seems well worth while to print the more important of these documents with such explanatory notes as can be furnished by officers who are familiar with the transactions to which they relate.

The Secretary of War, agreeable to my recommendation, has asked Congress for the necessary appropriation to print this insurgent history, which will be comprised in about five volumes of 500 pages each, and will furnish an interesting chapter of the first period of our occupation of the Philippines.

### PHILIPPINE EXHIBIT AT LOUISIANA PURCHASE EXPOSITION

In the World's Fair grounds at St Louis there are some forty-two acres of ground reserved for the Philippine exhibit. Today there are some fifteen large buildings, typical of the Philippine Islands, in process of completion. It is the intention to bring over some 1,200 natives of the Philippine Islands and about 10,000 tons of material.

The Philippine Commission has already appropriated $500,000 and the Exposition Company $200,000 for the payment of the expenses of this exhibit. It is believed that this will be the most

interesting feature of that expansion fair and furnish the opportunity for a large number of Filipinos to become acquainted with the United States and its institutions, as well as to furnish an object lesson to millions of Americans of the history and resources of the Philippines and their development under American occupation, and give opportunity to become acquainted with the Filipino people.

A battalion of 400 native troops, paid out of funds of the United States and part of the Regular Army of the United States; two companies of native constabulary, whose maintenance is at the expense of insular revenues, and the official constabulary band of some eighty pieces will also be stationed at St Louis during the term of the fair. About fifty prominent Filipinos, selected from the various provinces throughout the islands, will be present, and a few representatives of the non Christian tribes will also be part of the exhibit. The Bureau of Insular Affairs is charged with this work in the United States.

PHILIPPINE PRINTING PLANT

Government printing in the Philippine Islands during the past two years has been done by the public printing office of the Philippine Government. This is as thoroughly well equipped printing plant of its size as, I believe, exists in the world today, and I am told by experts that it is even more complete in its accessories than the public printing plant in this city. It is equipped with the most up-to-date labor-saving machinery that could be purchased, among which is a full equipment of linotypes. The purchase of all the machinery and supplies, as well as the selection of the original employés, were made by this Bureau.

This printing office is part of the educational system of the Philippines—an industrial school, of which, with the exception of the foremen instructors, the students, or personnel, are made up of native Filipinos. Experts tell me that the printing it turns out is equal to anything done in the United States.

PUBLIC DOCUMENTS

In the past two years we have made a collection of all official documents in any way relating to our insular possessions. This compilation embraces over 6,000 separate publications and has been bound together in about 200 volumes. That this voluminous compilation might be consulted to advantage, an index is now nearing completion which it has taken some two years' work to prepare. It will contain references, not alone to the insular compilation, which is directly available only to those who possess the same, but also to the congressional and other documents, by title, number, and page. It is purposed to print this index and thereby make this *terra incognita* of public documents available to every one.

During the short life of the Bureau some seventy-five congressional resolutions of inquiry have been passed and referred to it, the response to some of which required a large number of clerks for many months. The answer to one resolution alone resulted in five large printed volumes.

The Bureau has prepared many publications. I do not dare to even mention them, so great is the present extent of this paper.

Association with this work of government in our insular possessions becomes absorption. It is dangerous to give such a one a chance to talk about it. The result, I am afraid you will find, is prolixity. Still, when I think how hard we have tried and of the faithful industry rendered by my various assistants, many of whom have become experts in the novel work assigned them, I cannot help but believe that I have been modest in their representation in failing to mention the many things the Bureau has done and which an official record might properly contain.

# FORECASTING THE WEATHER

BY watching the clouds, the direction of the wind, the amount of moisture perceptible in the air, and other local signs, any person may become a tolerably good weather prophet. Some of the principal phenomena that must be noted and in what manner are described in a recent report by Alfred J. Henry, Professor of Meteorology in the United States Weather Bureau.

## CLOUDS

Clouds are formed from the moisture that is always in the air in varying quantities, even over the desert. Like the air itself, the moisture that is within it is invisible so long as it remains in the form of a gas. When a mass of air is cooled by any means whatsoever, a portion of its water vapor is condensed and becomes visible—a mist or cloud is formed. A familiar illustration of cloud formation in nature is afforded when a current of warm, moist air strikes a cold mountain. The colder surface of the mountain condenses some of the moisture that is in the air, forming a cloud which frequently obscures the top of the mountain and floats away in the prevailing winds. This simple phenomenon indicates to an observer on the leeward side of the mountain that a warm, moist current of air, with probably rain or snow, is approaching. In some parts of the world the formation of a cloud cap on a mountain top is not an indication of precipitation; yet in the majority of cases it is believed to be a reliable prognostic of falling weather. In general, the formation of cloud after a clear spell is the first sign of coming rain. Unfortunately there is no definite interval between the time of the first appearance of clouds and the occurrence of rain. Rain may not fall for several days after the first appearance of clouds, and, on the other hand, it may begin within two or three hours after the first cloud makes its appearance.

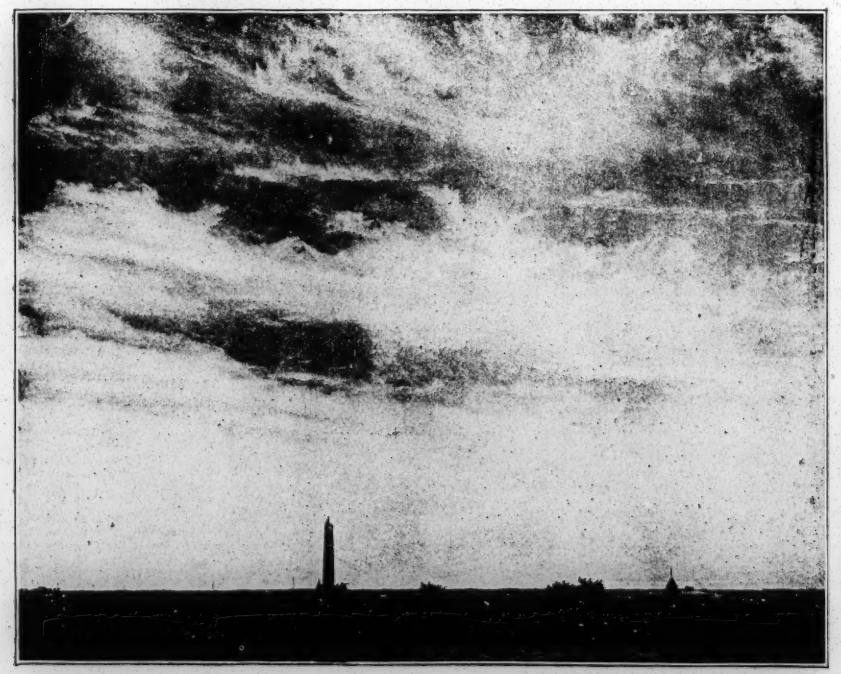
The various cloud forms generally observed in the United States, with their especial significance, are given in figures 1–6.

## THE TEMPERATURE AND MOISTURE OF THE AIR

An increase in the amount of moisture in the air is indicated in various ways. It is especially noticeable to the senses when coupled with a high temperature. Man does not need a thermometer to tell him that the air is oppressively warm, nor a hygrometer to tell him that there is an unusual amount of moisture present. A pitcher of ice water on a hot summer day is not a bad sort of hygrometer. The pitcher is naturally cooler than the surrounding air, and consequently some of the water vapor in the air is condensed and collects on the outside of the pitcher. It will be remembered that water vapor changes to the liquid state when the air is cooled below a certain point. The principle illustrated by the pitcher of ice water is repeated on a grand scale in nature every time rain or snow falls. First, there is the cooling of the air and the formation of cloud, the latter being composed of minute particles of water; second, there is the further cooling of the cloud mass, so that its particles join to form small raindrops, which fall to the earth by their own weight. When a rain cloud strikes the top of a mountain, rain does not necessarily fall, but small mist-like particles of water are deposited on the relatively colder surfaces of the rocks and other objects on the mountain sides and top. These particles coalesce and run down the sides of the objects on which they are deposited precisely as frequently happens on a pitcher of ice water on a warm, humid

Fig. 1.—Cirrus Clouds

Light, feathery clouds that float at an elevation of 4 or 5 miles above the earth's surface. When in the form of plumes with frayed and torn edges increasing cloudiness and rain or snow are indicated.



Photos by Henry

Fig. 2.—Cirrus, Merging into Cirro-Stratus Clouds

A transitional form often seen when rain or snow is approaching. The cloud layer gradually thickens until the sky is obscured

day. If the mountain were warmer than the cloud mass there would be no condensation, but some of the moisture of the cloud would be evaporated and float away in the prevailing winds.

An unusual amount of moisture in the air in summer produces a feeling of closeness; physical labor is more enervating than when the air is dry and crisp. The change from sultry, oppressive weather is nearly always brought about by a series of thunderstorms, sometimes lasting over two days.

Summarizing the indications that may be drawn from the temperature and moisture of the air, it would appear that an increase in the amount of moisture in the air is a sign of a change from fair to foul weather, both winter and summer. In the colder months an increase in the temperature of the air above the average for the season, coupled with an increase in moisture, is a sign of rain or snow within twenty-four to forty-eight hours. In the summer an increase of temperature alone is not always an indication of rain; but these are not infallible rules. The old proverb, "All signs fail in dry weather," is as true today as when first formulated.

### THE WIND AND ITS SUCCESSIVE CHANGES

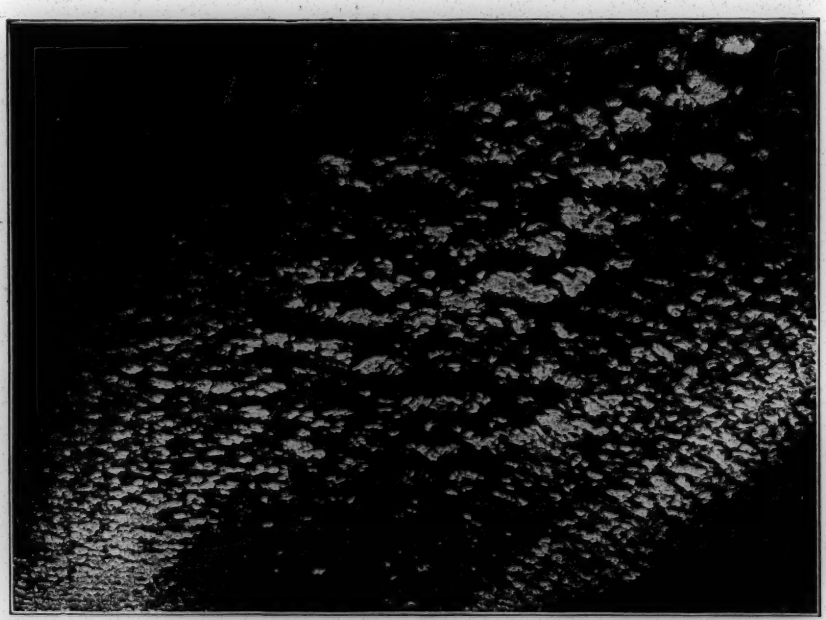
The wind is less prophetic in character than the clouds, since it is affected by the form of the land over which it blows. Thus it has a tendency to blow up a valley in the daytime and in the contrary direction at night, no matter in what direction the valley may extend. Winds also have a tendency to blow toward and up the sides of a mountain slope in the daytime and down the side of a mountain at night, and this movement of the air generally extends for some distance out from the foot of the mountain on the level slopes. There are also the well-known land and sea breezes of all countries, where during the twenty-four hours of the day the temperature of the land becomes alternately warmer and colder than that of the sea. These winds (valley, mountain, land, and sea breezes) are called diurnal winds. They are caused by differences in temperature that are not general, but confined to the valley or mountain slope of a particular locality. In order that these differences of temperature may arise there must be clear weather and unobstructed sunshine. It is easily seen, then, that all such winds must be most active in fair weather, and that when they cease, or fail to appear at the usual time, the atmosphere as a whole must have come under an influence greater than that which produced the diurnal winds.

In the open country or other exposed situation where the true direction of the wind can be determined, it should be noticed, first, what is the prevailing direction of the wind in fair weather, and what is the direction from which storms usually come. The direction of the wind during the twenty-four hours immediately preceding the storm should be especially noticed. To do this a short journal or diary of the weather should be kept. The direction of approach of storms in the United States varies in different localities. It is quite important that each observer determine for his immediate neighborhood the shift of the wind with the approach of storms, during the colder months at least.

In the warm months the winds are light and rather variable, and changes in direction have not the same importance as in the colder months. The rain of summer generally occurs in connection with thunderstorms; it will be found that these are most frequent for a certain direction and with the wind in a particular quarter. Beyond the fact that more thunderstorms come from a westerly quarter than from any other direction, little can be said that will be of value in forecasting their approach by the direction of the surface winds only. The coming of a thunderstorm can generally

Fig. 3.—Fair-Weather Cumulus Clouds

These clouds, it should be observed, have level bases and rounded tops, without the dome-like structure of figures—a type of cloud often seen after a spell of rain.



Photos by Henry

Fig. 4.—Cirro-Cumulus Clouds

Small round masses of clouds, usually at an elevation of 4 or 5 miles above the earth's surface. These clouds are typical of fair weather

be foretold a few hours in advance by the form and movement of the clouds.

In the colder months, viz, November, December, January, February, March, and April, the winds are stronger than at other seasons of the year, and storms also move with greater rapidity. The signs of falling weather in the colder months are the formation of a high sheet cloud covering the whole sky, an increase in the temperature and moisture of the air, and the change of the wind to some easterly quarter. The precise direction that the wind takes, whether northeast, east, or southeast, varies for different localities and the direction from which the storm is approaching. In New England, the Middle States, and the Ohio Valley northeasterly winds precede storms that approach from the southwest, and southeasterly winds precede storms that approach by way of the lake region. On the Pacific coast southeasterly and southerly winds precede rain storms. In Wyoming and other Northwestern States the heavy snowstorms of winter and spring generally come from the north or northwest with a strong wind from the same direction. The direction of the wind depends very much on the position of traveling storms that pass across the country.

The storms of the cold season have certain well-marked characteristics that should be easily recognized by every worker in the open air. These are: (1) The changes in the aspect of the sky; (2) the direction of the wind before, during, and after the storm; and (3) the shift of the wind, whether with or against the sun.

The clouds that precede the storm by from twenty-four to thirty-six hours are almost invariably light, wispy cirrus, of the general character shown in Fig. 1. Soon after the appearance of clouds of this class a sheet cloud forms at a slightly lower elevation and gradually thickens until the sun is hidden. Figure 2 illustrates the sheet cloud in the first stages of formation.

The subsequent clouds are much darker than those above mentioned, and appear to form at much lower elevations. When the sky becomes overcast the wind generally freshens, the temperature rises, and the air becomes humid; in popular speech, "it feels like rain."

## LOW PRESSURE AND HIGH PRESSURE

The weather experienced from day to day depends upon the frequency and the course followed by areas of low pressure and the succeeding areas of high pressure which generally follow them. These are exceedingly variable both as to direction and rate of movement. Some move rapidly from the northeastern Rocky Mountain slope to the maritime provinces of Canada at a uniform rate, while others have a rapid rate of progression at the beginning, but quickly slow down and finally cease to move. There are, however, certain characteristics possessed by both highs and lows, which, if once fully understood, would greatly assist the individual observer in making a forecast of the weather for the morrow. Figure 8 is a reduced copy of the daily weather map of December 15, 1892, and is introduced to illustrate some of the characteristics above mentioned.

If we divide the diagram into four equal parts by lines passing east and west and north and south through the word *low*, and calculate the average temperature for each part or quadrant of the oval figure, we will find it to be 17° for the northwestern quadrant, 50° for the southwestern, 59° for the southeastern, and 35° for the northeastern. The distribution of temperature is also shown by the dotted lines (isotherms). In the upper left-hand corner of the diagram the temperature is 10° below zero (—10); between that line and the one next below, temperature varies from 10° below to zero, and so on until the

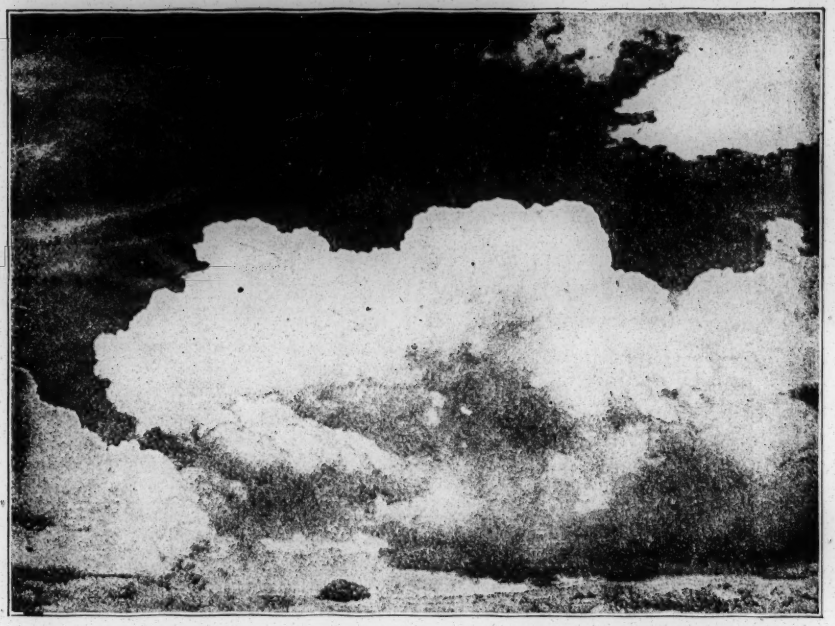


Fig. 5.—Cumulus Clouds

Cumulus clouds, as in the above, illustrating the formation of a central core of ascending warm air, generally precede local rains or thunderstorms by a few hours.

Photos by Henry

Fig. 6.—Near View of Large Cumulus Clouds

The small detached clouds on the lower left-hand margin of the cloud are almost invariably seen in advance of thunderstorms. Cumulus clouds, like those shown, rarely give rain at the point of observation, since their prevailing drift in these latitudes is eastward.

lower left-hand corner is reached, where it will be noticed temperature is 60° above zero. On the lower right-hand corner temperature is only 40° above zero. So far as temperature is concerned, therefore, we note that the right-hand* side of an area of low pressure is warm and the left cold.

The direction of the wind is shown by the small arrows in different parts of the diagram. These, it will be noticed, winds have a general southerly direction, in the northeast quadrant easterly winds prevail, while in the northwest and southwest quadrants the winds are mostly northwest to west. An observer stationed in lower Michigan at the point *A* will have fresh easterly winds, shifting as the storm center approaches him around to the south by way of southeast, and as the center passes him shifting still farther to the west or northwest.

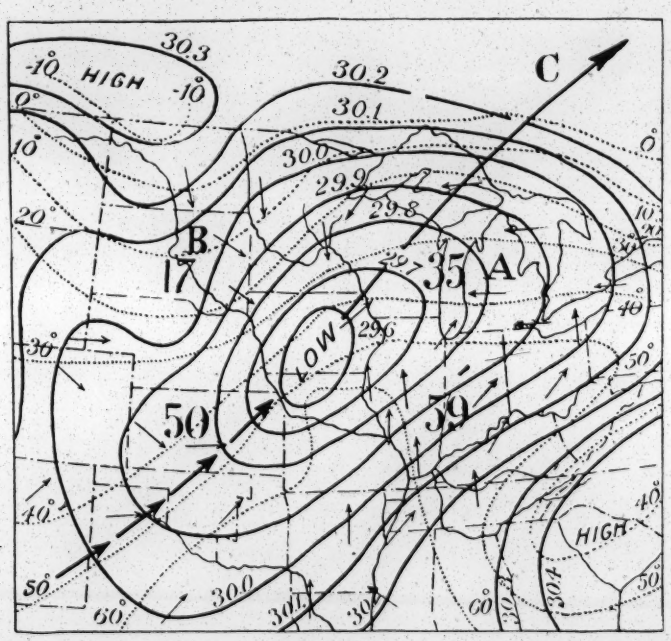



Fig. 7.—Weather Map (reduced) of December 15, 1892, Showing Typical Winter Storm

are disposed about the center of the storm (the inmost oval marked "Low") in a rather orderly system. The wind does not blow directly toward the center, but rather spirally about it, as discovered a little more than half a century ago. In the southeast quadrant the This is what is meant by "shifting with the sun." On the other hand, an observer in South Dakota at the point *B* first experiences a wind from the north, and as the storm center approaches and passes him the wind backs to the west by way of northwest, and this is the meaning of the term "shifting against the sun, or backing." The weather experienced in the two locations, *A* and *B*, will differ as regards both temperature and precipitation. At station *A* the tem-

* A person standing in the center of a storm, facing in the direction in which the storm is moving, will have the warm side on his right hand and the cold side on his left and in the rear.

perature will rise, and it will continue high until after the center of the storm has moved, say to *C*. With the shift of the wind to the northwest the temperature will begin to fall and the downward tendency will continue for twelve to twenty-four hours. The observer at station *B* will experience cold weather from the start, but the fall in temperature will not be quite so great as at station *A*. At station A the storm will begin with a warm rain, turning to sleet and snow as the center passes and the wind shifts to a westerly quarter. At *B* the precipitation will be mostly in the form of snow.

The foregoing few generalizations apply equally well in all parts of the country east of the Rocky Mountains. They will be found most useful, however, in the middle and upper Mississippi and Ohio valleys, the lake region, and the Middle States. As soon as they are thoroughly understood the local observer will be able to detect in the atmospheric changes, apparent to the eye or apprehended by the sense of feeling, the coming of an area of cloud and precipitation with its attendant whirling winds—warm on the front and right-hand side and cold in the rear and on the left-hand side.

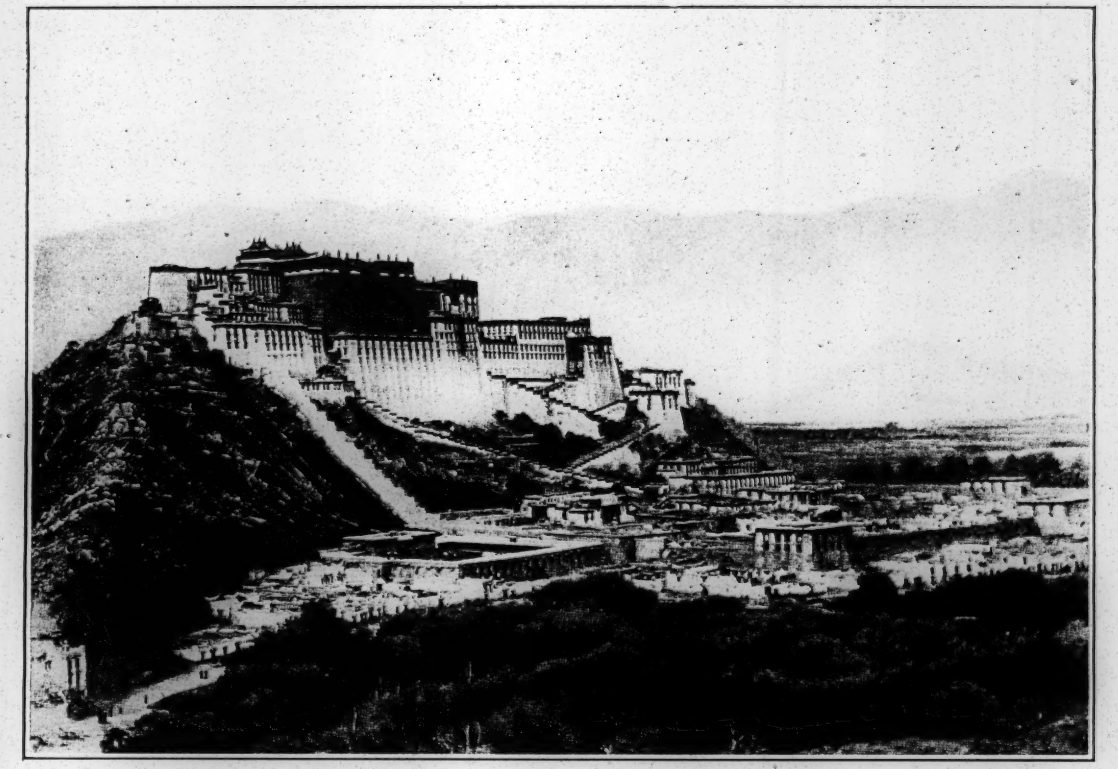
## NOTES ON TIBET

AT a recent meeting of the Asiatic Society of Japan, Rev. Ekai Kawaguchi, who succeeded in living nearly one year in Lhassa, 1901-1902, gave an address on his "Personal Experiences among the Tibetans," of which the following notes are given:

The architecture of Lhassa is typical of that of all Tibet. The temples are built of stone. Their roofs are flat and covered with a cement-like substance. The general form is castle-like. The houses are mostly constructed of a sort of adobe or sun-dried bricks. They are lighted from above by means of a kind of sky-light without glass. In the better homes the ceiling is covered with a white cloth. They have no floors, natural earth serving instead; but in the corner of the room there is a carpet, where they sleep, sometimes also sit, and whither they always show guests. In material and finish, the houses are rough. Timbers and boards are not planed or polished.

The name of Lhassa signifies "Country of God." Looked at from a distance, it also may give that impression; but a single close view shows that it is a misnomer. It is, in fact, a very dirty place. The streets are narrow and filthy. The shops of the city are of two sorts. One kind is similar to those of Japan—a room with the side open and the wares exposed to view from the outside. The other variety is simply stands or places in the street where the goods are spread out to view. The usual size of a shop is about twelve feet; twenty or twenty-five feet would be very large. In them are sold cloth, butter, tea, flour, Chinese breads, and native products generally; also some foreign things (not specified). Some foreign foodstuffs are imported from India, but they are very dear and only the rich can afford to buy them. Restaurants exist, and in them noodles chiefly are sold. Noodles, with a little meat added, would be a Tibetan feast.

Most of the people in Lhassa are, of course, Tibetans; but there are also Nepaulese to the number of four or five hundred, about two hundred Cashmerians, and many Chinese. Tibetans in many respects resemble Japanese, but in some respects they differ from Japanese. In strong contrast with Japanese are their great stature and their filthy habits. Their indifference to dirt may be indicated by saying that a Tibetan's



Potala, the Palace of the Grand Lama, Lhassa

From "Journey to Lhassa and Central Tibet," by Sarat Chandeas Das. Edited by W. W. Rockhill. E. P. Dutton & Co.

ideals of cleanliness are the Chinese. Tibetans represent themselves as being very religious. They pretend to be devout Buddhists. If asked about their purposes or desires in life, they would reply that their one ideal and their one desire is Buddha, or to realize Buddhism. For this they work, live, steal. But this is mostly pretense. Outwardly they appear calm, mild, and simple, but inside they are harsh and cruel.

The rule is polyandry, but polygamy is occasionally met with. For example, if there be a family of five sons, all together take one wife. The eldest is then called "father," and each of the others is called "uncle." On the other hand, if there be a family of three daughters and no sons, all three sisters take one husband.

Among the Tibetans there are four different forms of funeral ceremony. They arise from the Indian proverb that man comes from four elements, viz., earth, water, fire, wind. According to the first ceremony, the bones are crushed, the flesh is cut in pieces, the body cooked and fed to dogs, birds, and eagles. According to the second ceremony, the body is burned, consumed by fire. This is not common, but is sometimes practiced. In the third ceremony, the corpse is thrown into one of the great rivers, after having been decapitated and dismembered. According to the fourth form, the body is buried in the earth. This method is rarely employed, only when the other ceremonies are inconvenient. Music and literature among the Tibetans are at a very low stage. They have but a single musical instrument. It is similar to the *samisen*.

## THE BULLOCK-WORKMAN EXPLORATIONS

IN No. 21 of the *Mitteilungen des Deutschen und Oesterreichischen Alpenverein* for 1903 Maj. Max Schlagintweit makes the following statement:

"The glacier region of Chogo Lungma was already explored in the year 1856 by my brother, Adolf Schlagintweit, and volume 1 of the Travels of the Brothers Schlagintweit presents a large view of this glacier. The Americans, Dr and Mrs Bullock Workman, were not, therefore, the first to set foot in that region, since their predecessor in its exploration was a German."

In reply to this statement we would say, we have carefully examined at the Library of the Royal Geographical Society in London the volume referred to and failed to find in it any mention whatever of the Chogo Lungma glacier. Not even the village of Arandu, below the termition of that glacier, is mentioned. Again, neither the Chogo Lungma glacier nor the village of Arandu is noted on the maps accompanying the large atlas of illustrations issued with the work, nor is any view of the Chogo Lungma to be found among the illustrations themselves.

A view is given of a fragment of a glacier called by the Schlagintweits Chorkónda, but this does not resemble the scenery at any point of the Chogo Lungma, and the position assigned in latitude and longitude to the Chorkónda places it a considerable distance southeast of the Chogo Lungma.

The nearest point to the Chogo Lungma visited by Adolf Schlagintweit appears to have been Chutrun, at the entrance of the Basha Valley, more than two marches below Arandu.

In 1862 Col. Godwin Austen, while surveying in this region, ascended the valley in which the Chogo Lungma lies some 12 miles. So far as we have been able to learn, there is no record of any one having visited or explored the upper 18 miles of this glacier or its terminal branches previous to our explorations in 1902 and 1903.

FANNY BULLOCK WORKMAN.
WILLIAM HUNTER WORKMAN.

### A NEW HARBOR IN PORTO RICO

ANOTHER good harbor in Porto Rico has been added to those which the labors of the U. S. Coast and Geodetic Survey have introduced to the world at large. Although every harbor in Porto Rico has doubtless long been known to fishermen and local traders, the cartographers knew nothing about Ensenada Honda, Jobos, or Guyanilla until the detailed hydrographic surveys of the Coast Survey were published.

To the list above given may now be added Boqueron Bay, which has just been surveyed. It lies ten miles to the southward of Mayaguez and four miles north of Cabo Jojo, the southwestern point of Porto Rico.

Boqueron Bay is an indentation on the coast about two miles deep and two miles wide at the mouth. It is protected by a coral reef across the mouth, through which two passages lead into the harbor. Through the northernmost, close under point Guaniquilla, four fathoms can be carried, while the passage just south of the middle of the reef has a depth of six fathoms. Once inside, good holding ground of not less than four fathoms is found over an area of about one and one-half square miles. The water shoals towards the head of the bay where the small town of Boqueron is situated. This forms the commercial outlet for the valley of the Borinquen River and of the region as far back as the town of Lajas. This tributary region produces considerable quantities of sugar, molasses, and cocoanuts.

J. C. LANDERS.

*Coast and Geodetic Survey.*

## GEOGRAPHIC LITERATURE

**The Romance of the Colorado River.** By Frederick S. Dellenbaugh. With maps and illustrations. Pp. 800. New York: G. P. Putnam's Sons.

This work is an account of the exploration of this wonderful river from the time of Alarcon, Melchior Diaz, and the friars of the early Spanish days up through the explorations of early hunters and trappers, the army explorations, and finally the two expeditions of Powell. It is not generally known that Powell made two descents of the Colorado—the first, the narrative of which is well known, in 1869, and a second in the years 1871 and 1872. The story of this second trip through the series of wonderful cañons is here told for the first time and by a member of the expedition. Powell's second expedition through the cañons of the Green and Colorado necessarily followed the same route as his first, but the passage down the river was slow and was interrupted by many side trips, for the study of the geology and physiography of this wonderfully interesting region; so while the first expedition took but a little over three months, in the second passage of the cañons, which ended at the mouth of Kanab Creek, some sixteen months were expended, mainly in exploration of the surrounding regions. The story is fascinating and well told, for the author is an artist with the pen as with the brush. The book is beautifully printed on heavy paper and is amply and fitly illustrated. H. G.

**Floods of the Spring of 1903 in the Mississippi Watershed.** By H. C. Frankenfield. Profusely illustrated. Pp. 63. 12 x 14 inches. Washington: U. S. Weather Bureau. 1904.

Mr Frankenfield gives a permanent and interesting record of the unprecedentedly high floods of 1903 in the Mississippi watershed, and of the work of the U. S. Weather Bureau in connection with the floods. The high water

at New Orleans in April was forecast by the Weather Bureau four weeks in advance, which gave ample time to construct additional levees in the city and saved millions of dollars of property, according to the estimate of the New Orleans Cotton Exchange. The floods of May and June in the middle Mississippi and lower Missouri valleys were the most disastrous in our history. The ruin and desolation were beyond description. At least 100 lives were lost and $40,000,000 value of crops and industries swept away. Mr Frankenfield publishes a number of illustrations showing the raging torrents and flooded cities; also maps of the drainage basin of the Mississippi River and of the overflowed areas and levee systems, and charts showing the precipitation which caused the floods.

**Geographen-Kalendar. 1904–1905.** By Hermann Haack. Pp. 290. 4½ x 6½ inches. With 16 maps. Gotha: Justus Perthes. 1904.

This useful annual volume contains—

(1) A series of tables of areas, lengths of degrees of the parallel and meridian, etc.

(2) Brief summaries of the geographical events of 1903, with maps.

(3) Explorations in 1903.

(4) Geographical literature in 1903.

(5) Obituaries of geographers who died in 1903.

(6) Directory of geographical organizations and bureaus of the world.

**The Alaskan Boundary.** By George Davidson. Royal octavo, pp. 235, with maps. Published by the Alaska Packers' Association, San Francisco, 1903.

This is a complete history of the boundary between Alaska and Canada from the earliest days down to and including the award of the Joint Commission. It contains copies of treaties, conventions, and other state papers relating to that boundary. It is probable that nothing could show more conclusively the childish absurdity of the claims of Canada than this cold, dispassionate statement of facts. H. G.

**Notes on Panama** is the subject of a bulletin of 300 pages, compiled by Capt. G. E. Hale and published by the War Department. The report contains a large map of the republic.

ARTICLES FROM JUNE MAGAZINES

Two Pacifics, Harold Bolce. Booklovers' Magazine.

Orange Culture in California, Allen Sutherland. Do.

Fisherfolk of Newfoundland, P. T. McGrath. Outing.

Physiographic Control; Chattanooga Campaigns of the Civil War, Frederick V. Emerson. Popular Science Monthly.

Immigration, Dr Allan McLaughlin. Do.

Daughters of the Nile, Broughton Brandenburg Pearson's.

Marvelous Development Lower California. Modern Mexico.

Morocco and Anglo-French Agreement, Walter B. Harris. The Independent.

The Modern Steerage, Winthrop Packard. The World To-day.

National Bureau of Standards, Leroy T. Vernon. Do.

A Land where Banana is King, Francis Trevelyan Miller. Do.

De l'Atlantique au Tchad par la Benoue Lenfant, La Geographie, Paris.

Volcanic Origin of Oil, Eugene Coste. Journal of the Franklin Institute.

Government Irrigation Work, Guy E. Mitchell. Scientific American.

West African Negroland, Lady Lugard. Journal Royal Colonial Institute.

Projected New Barge Canal, Thomas W. Symons Bulletin American Geographic Society.

First Impressions of Japan, George Kennan. Outlook.

The Mountains, Steward Edward White. Do.

Riviera of Russia, Victor Dingelstedt. Scottish Geographical Magazine.

From the Atlantic to Chad by Niger and Benue, Captain Lenfant. Do.

Turkestan and Corner of Thibet, Oscar T. Crosby. Geographical Journal.

Desiccation of Eur-Asia, Prince Kropotkin. Do.

National Antarctic Expedition, Captain Colbeck. Do.

The Waldseemuller Facsimiles, Edward Heawood, M. A. Do.

# GENERAL ANNOUNCEMENT

# EIGHTH INTERNATIONAL GEOGRAPHIC CONGRESS, WASHINGTON, 1904

THE attention of the members of the National Geographic Society and all persons interested in the science of geography is invited to the following General Announcement of the Committee of Arrangements of the Eighth International Geographic Congress. Those intending to become members of the Congress should address the Secretary of the Committee of Arrangements, J. H. McCormick, Hubbard Memorial Hall, Washington, D. C.

HUBBARD MEMORIAL HALL,

WASHINGTON, D. C., U. S. A., *June, 1904.*

The Executive Committee of the Seventh International Geographic Congress, held in Berlin in 1899, having voted to convoke the Eighth Congress in Washington, a Committee of Arrangements was, at the instance of the National Geographic Society, organized on behalf of several geographic societies and clubs, viz:

National Geographic Society.
American Geographical Society.
Geographical Society of Philadelphia.
Geographic Society of Chicago.
Geographical Society of Baltimore.
Geographical Society of the Pacific.
Geographical Society of California.
Peary Arctic Club.
Appalachian Mountain Club.
American Alpine Club.
Mazamas.
Sierra Club.
Harvard Travelers' Club.

After issuing a brief announcement through the scientific press late in 1903, this Committee of Arrangements, in January, 1904, circulated a preliminary announcement inviting geographic societies and cognate institutions and all persons interested in any phase of geographic science to participate in the first international congress to be held in the western hemisphere in September of this year. Gratifying replies have been received; several hundred individuals and institutions have already registered as members of the Congress; a number of delegates have been appointed to represent geographic societies in different parts of the world; notice of the appointment of a number of governmental representatives has been received, while titles of nearly 200 papers have been submitted for presentation before the Congress.

The plans of the Committee of Arrangements and other committees are now sufficiently advanced to warrant the issue of this general announcement and to extend a cordial and specific invitation to all persons interested in the science of geography to become members of the Congress and participate in its proceedings.

## TIMES AND PLACES OF CONVENING

After assembling informally in Washington on the evening of September 7, 1904, the Congress will formally convene on Thursday, September 8, at 10 o'clock. It will reconvene in Philadelphia on Monday, September 12, at 9 o'clock; and again in New York on Tuesday, September 13, at 10 o'clock. After a field meeting at Niagara Falls on Friday, September 16, it will reassemble in Chicago on Saturday, Sep-

tember 17, at 10 o'clock; and it will finally convene in St Louis in conjunction with the International Congress of Science and Arts, on Monday, September 19, at 10 o'clock.

For convenience the meetings will be classified as (1) General Sessions, usually held in the forenoon; (2) Sectional Meetings, usually afternoon; (3) Field Meetings; (4) Evening Lectures, and (5) Social Gatherings.

HEADQUARTERS

Until September 7 the office of the Congress will be in Hubbard Memorial Hall (the home of the National Geographic Society), corner 16th and M Streets N. W., Washington, D. C. On Wednesday, September 7, the records will be transferred to the Ebbitt House, 14th and F Streets N. W., and this hotel will remain the headquarters during the stay of the Congress in Washington, and the secretaries will be in constant attendance for registering members, supplying badges, furnishing information, etc.

On September 12 an office for registration will be opened in the headquarters of the Geographical Society of Philadelphia, 1520 Chestnut Street.

On the morning of the 13th an office for registration will be opened in New York, at the American Geographical Society building, 15 West 81st Street, which will be the headquarters of the Congress during its stay in New York.

On September 17 a registration office will be opened in Cobb Hall of the University of Chicago.

On the morning of September 19 a registration office will be located in the Hall of Congresses on the Exposition grounds in St Louis. On Saturday, September 24, the records will be retransferred to Hubbard Memorial Hall, Washington, where the office will be retained and where all correspondence should be directed before the final closing of the affairs of the Eighth International Congress.

REGISTRATION

Delegates, members, and associates, and persons desiring to become members, are requested to register on the earliest possible date at the local headquarters in the city in which they first attend the Congress. Those who participate in the Washington sessions are especially desired promptly to record their names and local addresses, in order to facilitate the preparation of lists of membership and the delivery of mail. Immediately on registering, members of the Congress will receive the official badge entitling them to the privileges of the Congress and to the courtesies extended to members by local committees.

HOTELS

In Washington the hotels recommended are as follows:

The Ebbitt House (headquarters), 14th and F Streets, American plan, $3 and $4 per day.

The New Willard, across street from the Ebbitt House (headquarters), three squares south of meeting place, European plan, $2.50 per day upward.

The Raleigh, 12th Street and Pennsylvania Avenue, European plan, $2 per day upward.

The Arlington, one block west of meeting place, American plan, $5 per day.

The Shoreham, across street from meeting place, European plan, $2 and $3 per day.

The Colonial, across street from meeting place, European plan, $1.50 per day.

Members preferring private or boarding houses to hotels can be accommodated at reasonable rates by communicating in advance with the Secretary of the Committee of Arrangements.

In New York the hotel headquarters will be in the Endicott, corner Columbus Avenue and 81st Street, where the rates (European plan) are from $1 to $3 per day.

In Chicago, Hotel Del Prado, midway

between Chicago University and Field Columbian Museum, will be found convenient; the rates (European plan) are from $1.00 to $2.50 per day. To those preferring downtown hotels, the Auditorium and the Auditorium Annex are recommended (European plan, $2.50 to $5.00 per day).

In St Louis the hotel headquarters will be the Inside Inn; the rates (European plan) are $2.50 per day, and $4.50 American plan. Persons desiring accommodations at this hotel should notify the Committee of Arrangements as soon as possible, in order to insure proper accommodations.

PROGRAM

The following general program for the Congress is proposed by the Committee of Arrangements, subject to revision by the Presidency after the first meeting in Washington:

*Wednesday, September 7*

Evening: Informal reception at Hubbard Memorial Hall by the National Geographic Society.

*Thursday, September 8*

Morning, 10 o'clock: Formal opening of the Congress, George Washington (Columbian) University Hall, 15th and H Streets.

Afternoon, 2.30 o'clock: Visits to Scientific Bureaus.

Evening, 8 o'clock: Lecture.

*Friday, September 9*

Morning, 10 o'clock: General session, devoted especially to governmental surveys.

Afternoon, 2.30 o'clock: Sectional meetings.

5 o'clock: Reception by Mrs Gardiner Greene Hubbard at "Twin Oaks."

Evening, 8 o'clock: Lecture by Prof. Dr Er. von Drygalski.

*Saturday, September 10*

Morning, 10 o'clock: Sectional meetings.

Afternoon, 2.30 o'clock: Sectional meetings.

Evening, 8 o'clock: Reception by President and Mrs. Peary.

*Sunday, September 11*

Members so desiring will have the opportunity of spending a few hours on an excursion boat, passing Mount Vernon and other points of geographic interest on the lower Potomac.

At 7 o'clock the Congress will take a Pennsylvania Railway train at the Sixth Street station, arriving in Philadelphia at 10 p. m.

*Monday, September 12*

Leaving Broad Street station at 9 o'clock, the party will be conveyed, under the guidance of members of the Geographical Society of Philadelphia, to Independence Hall. A brief visit will be made to the rooms of the American Philosophical Society, after which the party will be driven to the Free Museum of Science and Art of the University of Pennsylvania. Following an inspection of the museum, the members of the Congress will be the guests of the University at a luncheon at 1 o'clock at Houston Hall.

Preceding a field meeting in Fairmount Park, brief addresses will be made by local and other geographers. At 2.30 p. m. the foreign delegates and foreign members and associates will enter coaches and be driven through Fairmount Park and along the Wissahickon drive to the Philadelphia Country Club, where a subscription dinner will be tendered all foreign guests at 6 o'clock in the evening. The party will leave Broad Street station, in Pullman cars, for New York later in the evening.

*Tuesday, September 13*

Morning, 10 o'clock: General session in the lecture hall of the American Geographical Society building, 15 West Eighty-first street, devoted to oceanog-

raphy; introduced by an address from Sir John Murray.

1 o'clock: Buffet lunch at the American Museum of Natural History.

Afternoon, 2.30 o'clock: Sectional meetings in rooms of the American Museum of Natural History.

Evening, 8 o'clock: Public lecture.

9.15 o'clock: Reception tendered by the American Geographical Society.

*Wednesday, September 14*

Morning, 10 o'clock: Sectional meetings.

1 o'clock: Buffet lunch at the American Museum of Natural History.

Afternoon, 2.30 o'clock: Sectional meetings, devoted especially to commercial geography.

Evening, 8 o'clock: Subscription dinner complimentary to foreign delegates.

*Thursday, September 15*

At 9 o'clock the party will leave the pier at West One hundred and twenty-ninth street for an excursion up the Hudson River on the steamer *Richmond*. After passing through the lower valley and the highlands, landing will be made at Fishkill. Here trolley and elevator cars will transfer the party to the top of Mt Beacon, from which a splendid view of the Hudson Valley and bordering mountains may be obtained. Professor William Davis will conduct the field meeting on Mt Beacon.

Taking the steamer again about 4 o'clock, the party will proceed down the river to West Point, where landing will be made to visit the U. S. Military Academy. The corps of cadets will be seen in their regular afternoon exercises, closing with a dress parade.

The party will take a ferry from West Point to connect with the special train on the New York Central Railroad at 8 o'clock, while members leaving the party here will take steamer for New York at about 7 o'clock.

Lunch will be served on board the steamer before reaching Fishkill, and dinner will be served for members returning to New York after leaving West Point.

*Friday, September 16*

The party will arrive at Niagara Falls at 7 o'clock a. m. After an address on the geographic development of the great cataract by Mr G. K. Gilbert, there will be a general field meeting, in charge of geographers familiar with the region. The party will descend the river on the left (Canadian) side of the gorge in trolley cars to Queenstown; thence they will ferry to Lewiston, and ascend the right (American) side of the gorge past the Whirlpool Rapids, resuming the special train at 7.30 o'clock p. m.

*Saturday, September 17*

Morning, 8 o'clock: Arrive at Twelfth Street station, Chicago.

10 o'clock: General session at Cobb Hall.

1 o'clock: Buffet lunch at Hutchinson Hall.

Afternoon, 2.30 o'clock: Visits to various buildings of Chicago University, to Field Columbian Museum, to the Museum of Fine Arts, and to the Chicago Public Library.

Evening, 8 o'clock: Reception tendered by the Geographical Society of Chicago, at Historical Society Building.

*Sunday, September 18*

If desired by any considerable number of members, an opportunity will be afforded for a view of the Chicago lake front from an excursion steamer.

At 10 o'clock p. m. the party will take a special train on the Illinois Central Railway at Twelfth Street station (Twelfth Street and Michigan Boulevard) for St Louis.

*Monday, September 19*

Morning, 8 o'clock: Arrive at Union station; breakfast at station (Terminal Hotel), afterward taking a Wabash shuttle train to World's Fair Grounds.

10 o'clock · Meeting with the World's Congress of Science and Arts in the Hall of Congresses, Administration Building, World's Fair.

Afternoon: Opportunity for inspection of exhibits of geographic interest (to be listed in a later program).

*Tuesday, September 20*

Morning, 10 o'clock: Meeting with World's Congress of Science and Arts, in the Department of Sciences of the Earth.

Evening, 8 o'clock: Lecture by the President of the Congress, Commander Robert E. Peary, U. S. N.

*Wednesday, September 21*

The members of the International Geographic Congress will meet in conjunction with the World's Congress, and will have special opportunities for participating in discussions.

*Thursday, September 22*

A formal session closing the Eighth International Geographic Congress will occur at an hour and place to be announced in later programs.

TRANSPORTATION

Transportation from Washington to New York by special train over the Pennsylvania Railroad will be $5.

Transportation has been arranged (including sleeping-car berth and meals) from New York to Chicago and St Louis at greatly reduced rates. The cost of this transportation to members, from New York to Niagara Falls, Chicago, and St Louis, the special Pullman train, will be $45. This will include, beside railway fare, sleeping-car service and meals while traveling, and breakfast and transfer to World's Fair at St Louis, and also return railway fare from St Louis to New York, including stop-over privileges in Washington, but not sleeping car and meals from St Louis to New York. Tickets are good for return passage on any regular train on Baltimore and Ohio Railroad out of St Louis.

Definite arrangements have been made for an international excursion, leaving St Louis on the evening of September 24 by a special train which will proceed over the Santa Fé lines to the terminal station and hotel on the brink of the Grand Cañon of the Colorado, *via* Williams, Arizona, and will then run *via* El Paso and the Mexican International Railway to the City of Mexico. Thence the train will return over the Mexican National Railway *via* Laredo to St Louis. The cost of this international excursion, including sleeping-car privileges and meals, will be approximately $150; time required will be 12 to 14 days.

*Members desiring hotel or transportation accommodations, also those wishing to participate in the excursion, should notify the Committee of Arrangements as soon as possible in order that proper facilities may be accorded them.*

Books, maps, and instruments intended for use in the Congress, also cameras, are admitted free of duty. The owner, however, must make a declaration to that effect before the customs officers at the port of entry.

MEMBERSHIP

Membership in the Congress may be acquired by members of geographic and cognate societies on payment of $5 (25 francs, 1 pound, or 20 marks); persons not members of such societies may acquire membership by a similar payment and election by the Presidency. Members will be entitled to participate in all sessions and excursions of the Congress and to attend all lectures and social meetings in honor of the Congress; they will also (whether in attendance or not) receive the publications of the Congress, including the daily program and the final *Compte Rendu*.

Ladies and minors accompanying members may be registered as associates on payment of $2.50 (12½ francs, 10 shillings, or 10 marks); they shall enjoy all privileges of members except the rights of voting and receiving publications.

Teachers in public schools may also be registered as associates after nomination by two members and subject to the action of the Presidency, on payment of $2.50; they shall enjoy all privileges of members except the rights of voting and receiving publications.

Pending the opening of the Congress, subscriptions will be received by the Committee of Arrangements, and members and associates tickets will be either mailed to subscribers or held for delivery on registration; during and after September 8 subscriptions will be received and tickets will be issued at the official headquarters under the direction of the Presidency.

Geographers and their friends desirous of attending the Congress or receiving its publications are particularly requested to signify their intention at the earliest practicable date, in order that ticket certificates as members or associates may reach them safely; the privileges of the Congress, including the excursions and social gatherings, can be extended only to holders of tickets.

## SOCIETIES AND DELEGATES

It is hoped that the Eighth International Geographic Congress may be an assemblage of geographic and cognate institutions no less than of individual geographers; and to this end a special invitation has been extended to such organizations to participate in the Congress through delegates on the basis of one for each one hundred members up to a maximum of ten. No charge will be made for the registration of institutions, though the delegates will be expected to subscribe as members; and in order that the list of affiliated institutions may be worthy of full confidence, the Committee of Arrangements reserve the right to withhold the name of any institution pending nomination by the Presidency. The publications of the Congress will be sent free to all institutions registered. In order that the geographic societies of the Western Hemisphere may fully utilize the opportunity afforded by this Congress for establishing closer relations with those of the old world, Spanish will be recognized as one of the languages of the Congress, together with French, English, German, and Italian, in accordance with previous usage; a communication before the Congress may be written in one (or more) of these languages.

Scientific societies not strictly geographic in character, public libraries, universities, academies of science, and cognate institutions are invited to subscribe to the Congress on the basis of membership; they will then receive certificates, their names will appear in the published lists of members, and they will receive all publications of the Congress (including daily programs and the *Compte Rendu* as issued).

## COMMUNICATIONS

The subjects for treatment and discussion in the Congress have been classified as follows:

1. Physical geography, including geomorphology, meteorology, hydrology, etc.
2. Mathematical geography, including geodesy and geophysics.
3. Biogeography, including botany and zoölogy in their geographic aspects.
4. Anthropogeography, including ethnology.
5. Descriptive geography, including explorations and surveys.
6. Geographic technology, including cartography, bibliography, etc.
7. Commercial and industrial geography.

8. History and geography.
9. Geographic education.

A special opportunity will be afforded for the discussion of methods for surveying and map-making and for comparison of these methods as pursued in other countries with the work of federal and state surveys maintained in this country.

Delegates and members desiring to present communications before the Congress or wishing to propose subjects for discussion are requested to signify their wishes at the earliest practicable date. A list of titles of communications already offered is appended. It is especially needful that any titles offered hereafter shall be accompanied by abstracts (not exceeding 300 words in length) in order that the Presidency may take prompt action toward introducing the titles and abstracts in the general program to be published at the beginning of the Congress.

The time required for presenting communications should be stated; otherwise twelve minutes will be allotted. It is anticipated that not more than twenty minutes can be allotted for any communication unless the Presidency decide to extend the time by reason of the general interest or importance of the subject.

Titles and abstracts of communications may be submitted either through the Committee of Arrangements or directly to the Chairman of the Committee on Scientific Program. Pending the opening of the Congress, this committee shall decide whether the same are appropriate for incorporation in the program, though the decisions of the committee shall be subject to revision by the Presidency after the Congress convenes.

The preliminary announcement, issued in January last, having provided that proposals affecting the organization of the Congress should be submitted in writing before May 1, any such proposals hereafter received will be laid before the Presidency, who will determine whether they shall receive consideration at the Eighth Congress or be laid over for future action.

## PROGRAMS

The General Program, comprising titles and abstracts of communications, sectional assignments, announcements of general, sectional, and social meetings, etc., will be published on or about September 7. All titles, abstracts, etc., designed for incorporation in this program must be in the hands of the Committee of Arrangements not later than August 1, 1904.

Daily programs will be issued during the meetings in Washington and New York. Any matter designed for incorporation in these must be in the hands of the secretaries by six o'clock of the day preceding issue.

## COMPTE RENDU

The Presidency, with the aid of a Committee on Publication, will prepare a volume of proceedings or *Compte Rendu*, comprising those communications and abstracts which they deem it needful to publish; and this publication will be sent to all members of the Congress, including societies represented by delegates.

All communications and abstracts submitted for reading or printing shall be deemed the property of the Congress, and in every respect subject to the action of the Presidency, although a request for the return of any copy not approved for publication might be entertained at the option of the Presidency.

Authors of communications exceeding seven (printed) pages in length desiring separates shall order the same (specifying the number) in writing on their manuscript. Such separates will be furnished at cost of press work, paper, and cover, plus a small percentage (not exceeding twenty-five).

EXHIBITS

No exhibits will be arranged directly by the Congress. Opportunities for inspecting actual geographic work—*e. g.*, map-making, etc.—will be afforded especially in Washington in the offices and laboratories of the U. S. Geological Survey, the U. S. Coast and Geodetic Survey, and the U. S. Weather Bureau.

Opportunities will also be afforded for inspecting the exhibits of geographic character at the Louisiana Purchase Exposition in St Louis.

Publishers and other parties may make appropriate exhibits in connection with the Congress on approval of the Committee of Arrangements or the Presidency.

CORRESPONDENCE

Correspondence relating to the Congress before, during, and after the sessions herein announced, and all remittances, should be directed to

THE EIGHTH INTERNATIONAL GEOGRAPHIC CONGRESS,
Hubbard Memorial Hall,
Washington, D. C., U. S. A.

## ORGANIZATION

*Honorary President*

The President of the United States

*President of the Congress*

Commander Robert E. Peary, U. S. N.

*Honorary Vice-Presidents*

Their Excellencies:
The Russian Ambassador.
The Mexican Ambassador.
The Italian Ambassador.
The Ambassador from Austria-Hungary.
The Ambassador from France.
The German Ambassador.
The Ambassador from Great Britain.
The Minister from Sweden and Norway.
The Minister from Guatemala.
The Minister from Denmark.
The Minister from Haiti.
The Minister from Brazil.
The Minister from Costa Rica.
The Minister from Nicaragua.
The Minister from Japan.
The Peruvian Minister.
The Minister from Argentina.
The Belgian Minister.
The Minister from Siam.
The Chilian Minister.
The Minister from Colombia.
The Minister from Portugal.
The Minister from Cuba.
The Minister from Spain.
The Minister from Salvador.
The Minister from Ecuador.
The Minister from Switzerland.
The Minister from China.
The Minister from Uruguay.
The Minister from Paraguay.
The Minister from The Netherlands.
The Bolivian Minister.
The Minister from Panama.
The Minister from Turkey.
The Minister from Persia.
The Minister from the Dominican Republic
The Minister from Korea.
The Venezuelan Minister.

*Honorary Vice-Presidents*—Continued.

*Presidents of Previous International Congresses*

Duca di Sermoneta (Venice, 1881).

Nationalrath Doctor Gobat (Bern, 1891).

Sir Clements R. Markham (London, 1895).

Ferdinand Freiherr von Richthofen (Berlin, 1899).

*Presiding Officers Chosen by Host Societies*

—— —— (National Geographic Society).

—— —— (Geographical Society of Philadelphia).

—— —— (American Geographical Society).

—— —— (Geographic Society of Chicago).

*General Secretary*

Henry Gannett.

*Assistant Secretary*

George B. Shattuck.

*Treasurer*

John Joy Edson.

*Committee of Arrangements*

W J McGee, National Geographic Society, Chairman.

Henry G. Bryant, Geographical Society of Philadelphia.

George B. Shattuck, Geographical Society of Baltimore.

A. Lawrence Rotch, Appalachian Mountain Club, Boston.

Zonia Baber, Geographic Society of Chicago.

George Davidson, Geographical Society of the Pacific, San Francisco.

Frederick W. D'Evelyn, Geographical Society of California, San Francisco.

John Muir, Sierra Club, San Francisco.

Rodney L. Glisan, Mazamas, Portland.

Angelo Heilprin, American Alpine Club.

Herbert L. Bridgman, Peary Arctic Club.

William Morris Davis, Harvard Travelers' Club.

J. H. McCormick, Secretary.

*Finance Committee*

John Joy Edson, chairman, President Washington Loan and Trust Company.

David T. Day, United States Geological Survey.

Charles J. Bell, President American Security and Trust Company.

# TITLES OF PAPERS OFFERED TO JUNE 1, 1904

(ARRANGED BY TOPICS)

NOTE.—Authors of papers will kindly examine the titles announced in this preliminary program. If they are not satisfactory in any way, kindly notify the Secretary of the Committee on Scientific Program at the earliest possible moment.

All letters upon this subject should be addressed as follows:

PROFESSOR WILLIAM LIBBEY,
Princeton, New Jersey,
U. S. A.

## I. PHYSIOGRAPHY

### 1. PHYSIOGRAPHY OF THE LAND

1. Physiography of the Archean Areas of Canada
   Prof. A. W. G. Wilson, Montreal, Canada.
2. Gorges and Waterfalls of Central New York.
   Prof. R. S. Tarr, Ithaca, N. Y.
3. Physical History of Cape Cod.
   Prof. W. H. Niles, Boston, Mass.
4. Sur la Relief des Karpates meridionales.
   Prof. Emmanuel de Martonne, Rennes, France.
5. Geography of Mt Shasta and the Yosemite.
   Mark B. Kerr, C. E., Stent, Cal.
6. Physiographical Sketch of the Adirondack Region.
   Prof. J. F. Kemp, New York City.
7. Island Tying.
   F. P. Gulliver, Ph. D., Southboro, Mass.
8. The Complications of the Geographical Cycle.
   Prof. W. M. Davis, Cambridge, Mass.
9. The Bearing of Physiography on Suess' Theories.
   Prof. W. M. Davis, Cambridge, Mass.
10. Some Geologic Data in the Geography of the Mississippi River.
    Prof. C. W. Hall, Minneapolis, Minn.
11. Deflection of Michigan Rivers by Terrestrial Rotation.
    Prof. M. S. A. Jefferson, Ypsilanti, Mich.
12. Scientific Exploration of Caves.
    Prof. E. A. Martel (absent), Paris, France.
13. (Title later.)
    Prof. A. Penck, Vienna, Austria.
14. Classification of Mountains.
    Prof. W. N. Rice, Middletown, Ct.
15. Glacial Erosion in the Finger Lake Region of New York.
    M. R. Campbell, Washington, D. C.
16. The Sculpture of Massive Rocks.
    G. K. Gilbert, Washington, D. C.

### 2. METEOROLOGY

1. The Climate of Guam as Revealed by Meteorologic Observations on the Island during the Year 1902.
   Cleveland Abbe, Jr., Ph. D., Washington, D. C.
2. A Climatological Dictionary for the United States.
   Prof. A. J. Henry, Washington, D. C.
3. The Scientific Work of the Mount Weather Meteorological Research Observatory.
   Prof. F. H. Bigelow, Washington, D.C.
4. Suggestions Concerning a More Rational Treatment of Climatology.
   Prof. R. DeC. Ward, Cambridge, Mass.
5. The Climate of Canada.
   Prof. R. F. Stupart, Ottawa, Canada.
6. The Climate of Kimberley.
   J. R. Sutton (absent), Kimberley, South Africa.
7. Non-periodic Variations of the Atmospheric Circulation in the Region of the North Atlantic Ocean.
   Dr W. Meinardus, Berlin, Germany.
8. The Principles of Graphical Climatology.
   Dr K. Kassner, Prussian Meteorological Institute.
9. Antarctic Meteorology and International Coöperation in Polar Work.
   Henryk Arctowski, Brussels, Belgium.

### 3. OCEANOGRAPHY

1. Currents and Climatology of the North Pacific.
   Prof. G. Davidson, San Francisco, Cal.
2. Co-tidal Lines for the World.
   Prof R. A. Harris, Washington, D. C.
3. European Polar Sea Investigations.
   Prof. Knipowitsch,
   St Petersburg, Russia.
4. Deep Sea Deposits.
   Sir John Murray,
   Edinburgh, Scotland.
5. New Theory of Tidal Undulations in Oceanography.
   O. T. Olsen, Grimsby, England.
6. Border Seas of Japan.
   Prof. J. J. Rein, Bonn, Germany.
7. Physical Character and History of the Baltic.
   Prof. J. J. Rein, Bonn, Germany.
8. Evidence of Land Near the North Pole.
   Prof R. A. Harris, Washington, D. C.
9. Fifty Years in Oceanography.
   Prof. A. Lindenkohl,
   Washington, D. C.
10. Strömungen der huft und des Wassers.
    Prof. E Witte, Brieg, Germany.
11. Temperature Charts of the Azores.
    Prof. J. Thoulet, Nancy, France.
12. La Methode Graphique en oceanographie.
    Prof. J. Thoulet, Nancy, France.
13. Les travaux oceanographiques du labora toire de Nancy.
    Professor Thoulet, Nancy, France.
14. Oceanographic Instruments.
    Lord Kelvin (absent),
    Glasgow, Scotland.
15. Canadian Tidal Observations.
    Prof. W. B. Dawson (absent),
    Ottawa, Canada.

### 4 VOLCANOES

1. Hawaiian Geography.
   Prof. C. H. Hitchcock, Hanover, N. H.
2. The Destruction of Pompeii as Interpreted by the Volcanic Eruptions of Martinique.
   Prof. A. Heilprin, Philadelphia, Pa.
3. The Tower of Mt Pelée.
   Prof. A. Heilprin, Philadelphia, Pa.
4. The Volcanoes of Martinique, Guadeloupe, and Saba.
   Dr E. O. Hovey, New York City.
5. The Volcanoes of St Vincent, St Kitts, and St Eustatius.
   Dr E. O. Hovey, New York City.
6. Sur les characteres speciaux de la reparti-tion de la Mediterranie.
   Paul Vidal de la Blache, Paris, France.

### 5. EARTHQUAKES

1. Relations de la figure du globe avec la distribution des volcans et tremblements de terre.
   Prof. G. Lallemand (absent),
   Paris, France.
2. The Seismical Distribution and Tectonic Connections of Earthquakes in the United States of North America.
   Count de Montessus de Ballore
   (absent), Abbeville, France.
3. Ergebnisse der modernen erdbebenforschung.
   Prof. E. Rudolph (doubtful),
   Strassburg, Germany.
4. Submarine erdbeben und eruptionen.
   Prof. E. Rudolph (doubtful),
   Strassburg, Germany.
5. Vertikale bodenbewegungen beobachtet mit dem trifilargravimeter.
   Prof. A. Schmidt, Stuttgart, Germany.
6. The Energy of Large Earthquakes in Absolute Measure.
   Prof. de Kovesligethy,
   Budapest, Hungary.
7. A New Geometrical Theory of Earthquakes and the Absorption of Earthquakes' Energy by the Earth.
   Prof. de Kovesligethy,
   Budapest, Hungary.
8. Die Internationale Seismologische Staaten Association.
   Dr G. Gerland, Strassburg, Germany.
9. Uber die moderne Seismologie.
   Dr G. Gerland, Strassburg, Germany.

### 6. GLACIERS

1. Glaciers of British Columbia.
   G. Vaux, Jr., Philadelphia, Pa.
2. The Lewis Range of Northern Montana and its Glaciers.
   F. E. Matthes, Washington, D. C.
3. The Jostedalbræ in Norway.
   Prof. M. Ebeling (absent),
   Berlin, Germany.
4. Glacial Lakes and Pleistocene Changes in the St Lawrence Valley.
   Prof. A. P. Coleman, Toronto, Canada.
5. Studies of the Snow Region of the High Mountains of Northern Sweden.
   Dr Axel Hamberg,
   Stockholm, Sweden.
6. The Reservoir Lag in Glacier Variations.
   Prof. H. F. Reid, Baltimore, Md.
7. The Glaciers of Mt Hood and Mt Adams.
   Prof. H. F. Reid, Baltimore, Md.
8. Chatter-marks or Crescentic Sub-Glacial Fractures.
   Prof. G. K. Gilbert, Washington, D. C.
9. The Antarctic Glaciers.
   Henryk Arctowski, Brussels, Belgium.

7. MAGNETICS

1. The Magnetic Disturbances During the Eruption of Mt Pelée on May 8, 1902.
   Prof. L. A. Bauer, Washington, D. C.
2. Our Knowledge of the Distribution of the Earth's Magnetism Over the Ocean Areas.
   Prof. L. A. Bauer, Washington, D. C.
3. Magnetic Work of the Navy Department.
   Prof. G. W. Littlehales,
   Washington, D. C.

## II. MATHEMATICAL GEOGRAPHY

GEODESY

1. Recent Practice in the Coast and Geodetic Survey in Triangulation, Base Measurements, and Levelling.
   Prof. J. F. Hayford,
   Washington, D. C.
2. The Form of the Geoid as Determined by Measures in the United States.
   Prof. J. F. Hayford,
   Washington, D. C.
3. Photographic Methods Employed by the Canadian Survey.
   Arthur G. Wheeler, Calgary, Canada.
4. Recent Development in the Determination of Geographical Positions.
   Dr Adolf Marcuse,
   Gr. Lichterfelde, Germany.

## III. BIOGEOGRAPHY

1. BOTANICAL

1. The Remarkable Colony of Northern Plants along the Apalachicola River, Florida, and its Significance.
   H. Cowles.
2. The Importance of the Physiographic Standpoint in Plant Geography.
   H Cowles.
3. La Cartographie de Geographie Botanique.
   C. Flahault, Montpellier, France.
4. Method of Determining the Age of the Different Floristic Elements in the Eastern United States.
   Prof. J. W. Harshberger,
   Philadelphia, Pa.
5. Mitteilungen uber den fortschritt der pflanzengeographischen Kartographie und die sich daran anschliessende nomenclatur pflanzengeographischer formationen.
   Dr Oskar Drude, Dresden, Germany.
6. Zur Dynamik der Sinlsstoffe.
   T. Christen, Bern Switzerland.

2. ZOÖLOGICAL

1. Origin of Fresh-water Faunas.
   Dr T. Gill, Washington, D. C.
2. World-wide Distribution of Deep Sea Faunas.
   Dr A. E. Ortmann, Pittsburg, Pa.
3. Repartition geographique des Animaux.
   G. Grandidier, Paris, France.
4. (Title later.)
   H. A. Pilsbry, Philadelphia, Pa.
5. The Dispersal Centers of North American Fauna.
   Charles C. Adams, Ann Harbor, Mich.
6. Zoölogical Evidence of the Former Connection of South America and Africa.
   Prof. A. S. Packard, Providence, R. I.
7. The Establishment of game refuges in the United States Forest Reserves.
   A. Sampson, Haverford, Pa.

## IV. ANTHROPOGEOGRAPHY.

1. Pigmy Tribes of Africa and Their Distribution.
   S. P. Verner.
2. The Ainu, Aborigines of Japan.
   Prof. F. Starr, Chicago, Ill.
3. Entstehungsbedingungen des menschen.
   L. Chalikiopoulos, Brighton, England.
4. Race Types and Peoples Assembled at the Louisiana Purchase Exposition.
   Prof. W J McGee, Washington, D. C.
5. Correlation Between Ethnic Types and Environment.
   Prof. W J McGee, Washington, D. C.
6. Emphasis on Anthropogeography in the School.
   Miss E. C. Semple, Louisville, Ky.

## V. EXPLORATION

1. AFRICA

1. Physical Characteristics of the Kasai Valley, Africa.
   S P. Verner.
2. Africa between the River Jub and the Nile.
   A. Donaldson Smith, Philadelphia, Pa.
3. Results of the Mission to the Mobangi Shari
   A. Chevalier, Paris, France.
4. Madagascar before the French Occupation and Today.
   G. Grandidier, Paris, France.
5. Recent Researches by the French in the Sahara, and Methods of Desert Travel They Have Introduced.
   C. Rabot, Paris, France.

2. ARCTIC REGIONS

1. Desirability of Further Investigations on the Northwest Passage.
   A. J. Stone, New York City.
2. Verlauf und Ergebnisse der Deutschen Sudpolar Expedition.
   Prof. E. von Drygalski,
   Berlin, Germany.

3. The Antarctic.
Dr H. R. Mill, London, England.
4. The Physical Geography of the Antarctic.
Prof. N. C. G. Nordenskjold, Stockholm, Sweden.
5. The First American Arctic Expedition.
H. G. Bryant, Philadelphia, Pa.
6. A Comparative View of the Arctic and Antarctic.
Dr F. A. Cook, Brooklyn, N. Y.
7. Cruise of the *Belgica* (possibly).
Dr F. A. Cook, Brooklyn, N. Y.

### 3. ASIATIC

1. Besults of the Philippine Census.
Henry Gannett, Washington, D. C.
2. Ergebnisse einer Forschungsreise den centralen Tein-schan und Dsungarischen Ala-tau, in Jahre 1902.
Dr M. Friederichsen, Gottingen, Germany.
3. Geographical Progress in the Dutch East Indies.
Prof. C. M. Kan, Amsterdam, Holland.
4. First Exploration of the Hoh Lumba Glaciers and Sorbon. Two Record Ascents in the Himalayas.
Mrs Fanny Bullock Workman, Worcester, Mass.
5. The Moraine of the Great Chogo Lungma Glacier, Baltistan Northwest Himalayas.
Dr William Hunter Workman, Worcester, Mass.
6. The Scientific Results of the Russian Expedition to Kham.
Capt. P. K Kozloff (absent), St Petersburg, Russia.
7. Turkestan and Tibet.
Oscar T. Crosby, Washington, D. C.

### 4. AMERICA

1. The Geographical Work of the Geological Survey of New Jersey
Prof. H. B. Kummel, Trenton, N. J.
2. First Ascents and Altitude Determination in the Canadian Alps.
Prof. H. A. Parker, New York City.
3. Results of a Journey Around Mt McKinley.
Dr F. A. Cook, Brooklyn, N. Y.
4. The Geography of Alaska.
Dr A. H. Brooks, Washington, D. C.
5. Recent Explorations in British America.
Dr R. Bell, Ottawa, Canada.
6. Grundzuge des Geologischer Aufbaus von Mittelamerika.
Dr K. Sapper (absent), Wurtemberg, Germany.
7. The Physical and Economic Geography of Mexico.
Robert T. Hill, Washington, D. C.
8. A Crossing of South America by the Route of Pizarro and Orellana.
Dr A. Hamilton Rice, Boston, Mass.

### 5. GENERAL

1. Contributions to Geographical Science by the Carnegie Institute of Washington.
President D. C. Gilman, Washington, D. C.
2. Present Status of Discovery and Future Problems of Geographical Exploration in South America.
Dr Wilhelm Sievers, Giesen, Germany.

## VI. TECHNIQUE

1. Mother Maps of the United States.
Henry Gannett, Washington, D. C.
2. Application du systeme decimal à la mesure des Angles.
J. de Ray Pailhade, Toulouse, France.
3. Berichterstattung uber die Internationale Abkurzung von Titeln Geographischer Zeitschriften.
O. Baschin, Berlin, Germany.
4. Modern Hydrographical Methods.
Prof. M. Knudsen (absent), Copenhagen, Denmark.
5. Principles of Geographic Relief.
George C. Curtis, Boston, Mass.
6. Hydrologic Works of the Geological Survey in the Eastern United States.
Myron L. Fuller, Washington, D. C.
7. The Chronometer and Time Service of the U. S. Naval Observatory and the Present Status of Standard Time.
Lt. Comdr. Edward Everett Hayden, Washington, D. C.

## VII. ECONOMIC

1. The Relations of Commerce to Geography.
O. P. Austin, Washington, D. C.
2. La Valeur economique de la Suisse.
A. de Claparede, Geneva, Switzerland.
3. La Geographie economique et sociale au XX Siecle.
A. de Claparede, Geneva, Switzerland.
4. Geographical Development of the Internal Commerce of the United States.
Dr J. F. Crowell, Washington, D. C.
5. Die entwickelung der Deutschen Kolonien in Brasilien.
Dr A Funke, Berlin, Germany.
6. La Development de la Geographie economique depuis trente aus; magnifiques resultats obtenus et a obtenir encore.
C. Gauthiot, Paris, France.
7. The Extent and Efficiency of Governmental Promotion of Commerce in the Leading Countries.
Prof. E. R. Johnson, Philadelphia, Pa.

8. Rise and Development of the German Colonial Possessions.
   Graf Joachim v. Pfeil u Klein Ellguth, Lauban, Germany.
9. The Economic Importance of the Plateaus in Tropical America.
   Prof. J. R. Smith, Philadelphia, Pa.
10. Hydrography and Economics of the Nile Basin.
   Sir W. Willcocks, Cairo, Egypt.
11. Geographic Aspects of Commercial Museums.
   W. P. Wilson, Sc. D., Philadelphia, Pa.
12. Geographical Influences Affecting the Development of the Sugar Beet Industry in the United States.
   Dr H. C. Taylor, Madison, Wis.
13. The Atlantic Ferry.
   Capt. B. J. Kennelly, London, England.
14. Colonial Development in British Tropical Africa.
   Sir H. H. Johnston, London, England.
15. Oceanic Fishing Grounds.
   Capt. R. Dittmer, Hannover, Germany.
16. The Division of the Industrial Forces in France by Departments.
   Prof. E. Levasseur, Paris, France.
17. The Caribbean Regions and Their Resources.
   Francis C. Nicholas, New York City.
18. Game and Fur Bearing Animals and Their Influence on the Indian of the Northwest.
   Dr T. W. Thorndike, Boston, Mass.
19. La vateur commerciale et industrielle du Sahara français.
   Prof. E. T. Gautier, Algiers.
20. L'error economique de l'amerique, jugè du vieux continent.
   Georges Blondel, Paris, France.

## VIII. HISTORICAL

1. Ancient Oceanography.
   Prof. Guido Cora, Rome, Italy.
2. History and Economic Development of Saint Anthonys Falls.
   Prof. C. W. Hall, Minneapolis, Minn.
3. The Cabot Landfall.
   G. R. F. Prowse, Philadelphia, Pa.
4. North American as Known in 1804 and 1904.
   Gilbert H. Grosvenor, Washington, D. C.
5. Ancient Italian Maritime Itineraries.
   Prof. F. P. Garofalo, Naples, Italy.
6. Some Early Geographers of the United States.
   Rear Admiral C. M. Chester, Washington, D. C.
7. (Title later.)
   Prof. E. L. Stevenson, New Brunswick, N. J.
8. Des Chretiens de Saint Mathieu existant en Afrique au commencement du 14me Siecle et de l'identification a l'Ouganda de l'empire Chretien de Magdasor.
   Frederic Romanet du Gaillaud, Haute, Vienne, France.

## IX. EDUCATIONAL

1. College Entrance Examinations in Geography.
   Prof. W. M. Davis, Cambridge, Mass.
2. Geographical Excursions for Children.
   Miss Zonia Baber, Chicago, Ill.
3. Geography and History in the United States.
   Prof. A. P. Brigham, Hamilton, N. Y.
4. Observational Work for Children.
   F. Carney, Ithaca, N. Y.
5. Geography in the Normal Schools of the United States.
   Prof. C. R. Dryer, Terre Haute, Ind.
6. Die Bestrebungen der Culturnationen sur Hebung des Geographischen Schulunterrichts und ihre Beforderung durch internationalen Nachrichten Austausch.
   H. Fischer, Berlin, Germany.
7. School Geography in the United States.
   Dr Martha K. Genthe, Hartford, Ct.
8. Mathematical Geography for Teachers.
   Prof. J. P. Goode, Chicago, Ill.
9. Economic Geography in Secondary Schools.
   Prof. C. A. Herrick, Philadelphia, Pa.
10. Geographic Influence: A Field for Investigation.
   G. D. Hubbard, Ithaca, N. Y.
11. How to Make Geography Real to Students.
   Prof. M. S. A. Jefferson, Ypsilanti, Mich.
12. The Treatment of Economics in the Study of Commercial Geography.
   Prof. E. C. Jones, Ann Harbor, Mich.
13. Recent Progress of Geography in England.
   Dr J. Scott-Keltie, London, England.
14. Summer Schools in Geography.
   Prof. E. M. Lehnert, Winona, Minn.
15. Physiography in Universities.
   Prof. C. F. Marhut, Columbia, Mo.
16. Excursions in College Geography.
   Prof. W. H. Norton, Mt Vernon, Ia.
17. Physical Geography in High Schools.
   Miss M. I. Platt, Brookline, Mass.
18. Geographical Research.
   Miss E. C. Semple, Louisville, Ky.
19. Geographical Laboratories.
   W. H. Snyder, Worcester, Mass.
20. Practical Work in School Geography.
   R. H. Whitbeck, Trenton, N. J.
21. Educational Geography in the Western States.
   H. W. Fairbanks (absent), Berkeley, Cal.
22. Town Plans and Geography of Towns.
   Dr Eugen Oberhummer, Vienna, Austria.

Office Hours: 8.30 A. M. to 5 P. M. Telephone, North 306

# NATIONAL GEOGRAPHIC SOCIETY

**Hubbard Memorial Hall**
**Sixteenth and M Streets, Washington, D. C.**


W J McGEE . . . . . President
JOHN JOY EDSON . . . . Treasurer
G. K. GILBERT . . . . Vice-President
O. P. AUSTIN . . . . . Secretary
ELIZA R. SCIDMORE . . . Foreign Secretary

## BOARD OF MANAGERS

| 1902-1904 | 1903-1905 | 1904-1906 |
|---|---|---|
| A. GRAHAM BELL | CHARLES J. BELL | HENRY F. BLOUNT |
| DAVID T. DAY | GEORGE DAVIDSON | C. M. CHESTER |
| A. W. GREELY | WM. M. DAVIS | F. V. COVILLE |
| ANGELO HEILPRIN | JOHN JOY EDSON | D. C. GILMAN |
| RUSSELL HINMAN | G. K. GILBERT | S. H. KAUFFMANN |
| W J McGEE | A. J. HENRY | WILLIS L. MOORE |
| GIFFORD PINCHOT | O. P. AUSTIN | ISRAEL C. RUSSELL |
| HENRY GANNETT | C. HART MERRIAM | R. D. SALISBURY |


**The National Geographic Magazine is sent free of charge to all members of the National Geographic Society**

---

## Recommendation for Membership in the NATIONAL GEOGRAPHIC SOCIETY

The following form is enclosed for use in the nomination of persons for membership

**Please detach and fill in blanks and send to the Secretary**

DUES: Annual membership, $2; Life membership, $50. If check be enclosed, please make it payable to order of the National Geographic Society, and, if at a distance from Washington, remit by New York draft or post-office money-order.

.....190

To the Secretary, National Geographic Society, Washington, D. C.:

*Please propose*.....

*address*:.....

.....

*for membership in the Society.*

.....

Neatness Punctuality Fair Prices

JUDD & DETWEILER

PRINTERS

420-22 ELEVENTH ST. N. W.

WASHINGTON, D. C.

Established 1868 Phone, Main 536

"Pillar'd around by everlasting hills,
Robed in the drapery of descending floods."

NIAGARA

FALLS

One of the natural wonders of the world. A charming place at any season of the year, reached from every direction by the

NEW YORK CENTRAL LINES

A visit to the Falls is an object lesson in Geography; an exhibition of landscapes that no painter can equal, and a glimpse of the latest developments of the industrial world.

A copy of Four-Track Series No. 9, "Two Days at Niagara Falls," will be sent free, upon receipt of a two-cent stamp, by George H. Daniels, General Passenger Agent, Grand Central Station, New York.

WE MAKE THE HALFTONE PLATES FOR THIS MAGAZINE

GATCHEL & MANNING

ILLUSTRATORS
AND ENGRAVERS

27-41 SOUTH SIXTH STREET PHILADELPHIA, PA.

The Manhattan Press-Clipping Bureau

ARTHUR CASSOT, Proprietor

NEW YORK (Knickerbocker Building) LONDON

COR. FIFTH AVENUE AND 14TH STREET, NEW YORK

Will supply you with all personal reference and clippings on any subject from all the papers and periodicals published here and abroad. Our large staff of readers can gather for you more valuable material on any current subject than you can get in a lifetime.

TERMS:

100 clippings . . $ 5.00
250 clippings . . . $ 12.00
500 clippings . . . $22.00
1,000 clippings . . . $35.00

# HENRY ROMEIKE'S
# BUREAU OF PRESS CUTTINGS

33 Union Square, New York

Reads every paper of importance published in the United States, and through its European agencies in London, Paris, Berlin and Vienna every paper of importance published in Europe and the British Colonies. One subscription on any given subject will bring notices from the United States, and if desired also from the European papers.

WRITE FOR TERMS

---

# Back Volumes

OF THE

# National Geographic Magazine

The NATIONAL GEOGRAPHIC MAGAZINE has on hand a few copies of complete back volumes which may be obtained at the following prices:

| | | | |
|---|---|---|---|
| Vol. 3, 1891 . . . | $5.10 | Vol. 9, 1898 . . . | $2.75 |
| Vol. 5, 1893 . . . | 4.50 | Vol. 11, 1900 . . . | 2.50 |
| Vol. 6, 1894-5 . . . | 4.20 | Vol. 12, 1901 . . . | 2.50 |
| Vol. 7, 1896 . . . | 3.25 | | |
| Vol. 8, 1897 . . . | 3.00 | Vol. 13, 1902 . . . | 2.50 |

The NATIONAL GEOGRAPHIC MAGAZINE will pay the following prices for copies of certain back numbers:

Vol. 1, 1889, No. 2, $1.00; No. 4, $1.00.

Vol. 2, 1890, No. 2, $1.00.

Vol. 4, 1892, No. 1, $0.50; No. 2, $1.50; No. 3, $0.50; No. 4, $0.50; No. 5, $1.00; No. 6, $1.00.

Vol. 10, 1899, No. 6, $0.50; Index, $0.50.

Vol. 13, 1902, No. 1, $0.30.

---

**Hubbard Memorial Hall . . . Washington, D. C.**

# Our "Exposition Special" Traveling Trunk

WHETHER you are going to St. Louis, to Europe, or to 'Frisco, we are splendidly ready to equip you with the necessary things, in a leather way.

We call attention to our "**Exposition Special**" Trunk, which has the following five points to recommend it:

**Point 1—5 White Ash Slats on Top**
**Point 2—No. 5 Taylor Bolts**
**Point 3—3 Center Bands**
**Point 4—Metal Tray Lid Hinges**
**Point 5—Concealed Cup Lock; practically burglar-proof**

Other trunks may have any one of these points, but ours is the only trunk that has all five combined. We had this trunk made expressly for us and it is controlled by us. It is the best trunk made at the price.

| | |
|---|---|
| 28-inch, $7.95 | 34-inch, $10.00 |
| 30-inch, 8.50 | 36-inch, 11.00 |
| 32-inch, 9.00 | 38-inch, 12.00 |

40-inch, $12.75

**BASEMENT, EQUITABLE BUILDING**

## WOODWARD AND LOTHROP

**New York** **Washington** **Paris**

## SPECIAL MAPS PUBLISHED BY THE NATIONAL GEOGRAPHIC SOCIETY

**Map of Manchuria and Korea** (36 x 42 inches).
Prepared under the direction of the War Department.

**Map of the Philippines** (5 feet 2 inches x 3 feet).
Prepared under the direction of the War Department.

**Map of South Africa** (46 x 33 inches).
Prepared under the direction of the War Department.

**Map of Northeastern China** (36 x 28 inches).
Prepared under the direction of the War Department.

**Map of Alaska** (28 x 24 inches).
Prepared under the direction of the U. S. Geological Survey.

**Map Showing Alaskan Boundary Award** (12 x 12 inches).
Prepared under the direction of the U. S. Coast and Geodetic Survey.

**A Series of Twelve Maps on the Alaskan Boundary Dispute.**
Prepared under the direction of Hon. John W. Foster, ex-Secretary of State.

**Chart of the World on Mercator's Projection** (48 x 27 inches).
Prepared under the direction of the Hydrographic Office.

**Map of Cuba** (18 x 7½ inches).
Prepared under the direction of Robert T. Hill.

**A Series of Twenty-five Full-page Charts, showing storm tracks and methods of weather forecasting.**
Prepared under the direction of Dr. Willis L. Moore, Chief U. S. Weather Bureau.

**Panorama of the Wrangell Mountains, Alaska.**
A remarkable picture, showing scores of lofty peaks in an area as large as the State of Delaware.

**By Mail for Twenty-five Cents Each.**

NATIONAL GEOGRAPHIC SOCIETY, Hubbard Memorial Hall, Washington, D. C.


PRESS OF JUDD & DETWEILER, WASHINGTON, D. C.